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Current History

Vol. 34 MAY, 1958 No. 201

The issue of public power has been hotly debated for a quarter of a century, and its roots are buried in an earlier period when conservation first became a public concern. In the articles that follow we explore the development of various power projects. First of the large projects was TVA: "in the minds of many . . . a showpiece of the New Deal and it has borne the brunt of the reaction from that era." Partly for this reason, "many people in the area it serves, convinced that it has been a key factor in the rehabilitation of the region . . . are at the same time a bit nervous over the easy labels which have been applied."

The TVA Power Program

By John Oliver

Executive Vice-President, Development and Resources Corporation

In May, 1933, exactly 25 years ago to the month, President Franklin D. Roosevelt signed into law the bill creating the Tennessee Valley Authority. T.V.A. was born out of a controversy—what to do with the government properties at Muscle Shoals—and for the past quarter century it has been a continuing center of controversy.

It has been attacked from many quarters. The coal industry, the fertilizer industry, the power industry, the railroad industry, the National Association of Manufacturers, the United Mine Workers and the Associated General Contractors are but a few of the groups which, either sporadically or consistently, have expressed strong opposition to various phases of the T.V.A. program.

Interestingly enough, all these groups have benefitted greatly from T.V.A.'s activities. In the fiscal year 1957, T.V.A. bought over 20 million tons of coal. Its rail freight bill runs into millions of dollars. It has advanced fertilizer technology and helped expand the market for fertilizer products. Its demonstration of the promotional effect of low rates upon power consumption has increased the market for electric energy, not only in its own territory, but all over the country.

This article is concerned primarily with T.V.A.'s power program. However, T.V.A. is much more than a large federal power system, and some understanding of its other aspects is necessary to an understanding of the power program. While the observations that follow are believed to be factual, they are not those of an "objective" historian. The writer was for 12 years a member of the T.V.A. staff. He believes that the task assigned T.V.A. by Congress 25 years ago was worth doing, and that T.V.A. has carried out its job faithfully and with imagination, efficiency and zeal.

In the past 25 years, T.V.A. has built 20 major dams. These dams, together with a number of smaller structures that T.V.A. has acquired, regulate the waters of the Tennessee River and its tributaries to control floods, provide navigation and generate electricity. The navigation channel extends from the mouth of the river near Paducah, Kentucky, to Knoxville, Tennessee, a distance of 650 miles. About 2 billion ton-miles of traffic moved on this waterway in 1956. The dams protect the Tennessee Valley from damaging floods, and help reduce flood crests on the lower Ohio and Mississippi rivers. In January and February, 1957, T.V.A. had its greatest opportunity to date to demonstrate its effectiveness in flood control. It cut nearly 22 feet from the crest of what would otherwise have been a disastrous

flood at Chattanooga, saving a rich industrial area and about 12,000 houses from flood waters.

During the past 25 years, T.V.A. has developed and produced many new high-analysis fertilizers at the Muscle Shoals chemical plants and, in cooperation with state agencies, has demonstrated their usefulness on farms in many parts of the nation. The chemical plants are operated in national emergencies to produce munitions; during World War II, T.V.A. produced about 60 per cent of the elemental phosphorous used by the armed forces. More recently, T.V.A. operated a plant which produced for the Army Chemical Corps the principal ingredient for nerve gas. T.V.A. forest nurseries have grown nearly 400 million tree seedlings used to reforest 326,000 acres denuded by fire or wasteful cutting. The Tennessee River flows through a region that, in 1933, had an incidence of malaria among the highest in America. In some areas, 30 per cent of the people had malaria. T.V.A. attacked the malaria problem around its reservoirs and virtually eliminated the disease from the region.

There are 47 hydro-electric projects in the integrated T.V.A. power system: 29 built or acquired by T.V.A., 4 built by the Army Engineers on the Cumberland River, and 14 belonging to the Aluminum Company of America on tributaries of the Tennessee River. There are 15 steam plants in the system, eight built by T.V.A. and seven acquired from others. T.V.A. connected all the plants with one another and with the loads they serve by more than 11,000 miles of high voltage transmission lines. The generating capacity of the system exceeds 10 million kilowatts. In the fiscal year 1957, the system produced 61.4 billion kilowatt-hours of electricity.

Historical Roots of TVA

The historical roots of T.V.A. go back to a period much earlier than 1933. T.V.A. evolved naturally and logically from the many forces that had caused America's leaders to take stock of the nation's resources and to consider how best to conserve and develop them. From early colonial days, it had been assumed that America's resources were virtually inexhaustible. But around the turn of the century, it became clear to a few farsighted leaders that our resources were not only exhaustible, but were being used up at a staggering rate.

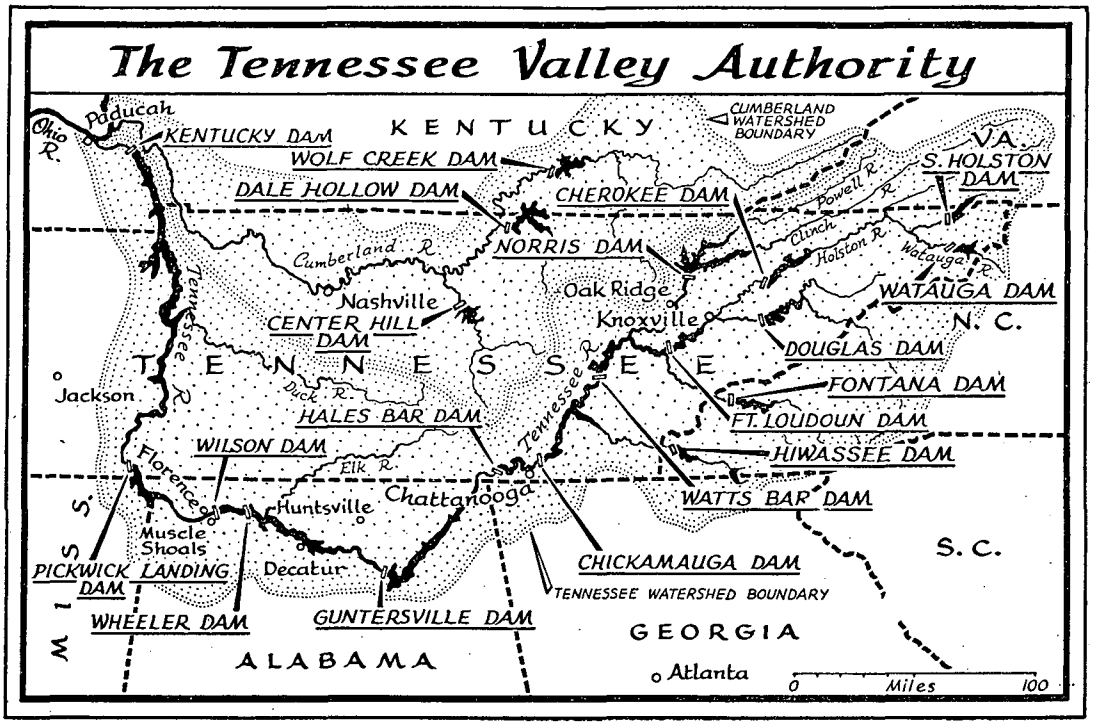
This was the period in which the first Reclamation Law was passed; it was the period when President Theodore Roosevelt appointed the Inland Waterways Commission to study and recommend methods for developing the nation's streams. The work of that commission led to the appointment of the National Conservation Commission, which prepared a report containing an inventory of the nation's resources, including waters, soils, forests and minerals.

The work and study of the early conservationists led to a clearer understanding of the interdependence of land, water and forests, and of the need for a unified approach to their development and use. This unified approach to the development of a region's resources is the very heart of the T.V.A. idea; for the first time a single agency was given responsibility for encouraging the development of all the natural resources of a single region.

During World War I, the Government built at Muscle Shoals, Alabama, two large nitrate plants and three small steam plants, and started the construction of Wilson Dam. The story of Muscle Shoals is told in another article in this issue, so it will not be repeated here. The T.V.A. Act of 1933 transferred these properties to T.V.A. and they formed the nucleus of the water control, fertilizer, and munitions programs.

What is Different About T.V.A.?

Taken individually, the things that T.V.A. has done are not unique. There is, of course, the matter of magnitude; T.V.A. has done things in a big way. But a more significant difference is the administrative form of T.V.A. and the breadth of the responsibilities assigned to it. T.V.A. is a government corporation, governed by a three-man Board of Directors. The Board reports to the President and to the Congress. T.V.A. is independent only in the sense that it is not part of one of the traditional depart-



From The United States: The History of a Republic, *by Richard Hofstadter, William Miller, and Daniel Aaron, p. 665. Copyright, 1957, by Prentice-Hall, Inc., Englewood Cliffs, N. J.*

ments headed by a cabinet officer. The law that created it is a corporate charter sufficiently broad to provide the ingredients for effective administration, namely: authority, responsibility, and accountability.

The T.V.A. Act of 1933 not only lays out a program, but vests in the T.V.A. Board of Directors what is, for a government agency, an unusual degree of administrative freedom to adopt management policies and devices needed to carry out that program. During most of T.V.A.'s existence, the majority of its Board has been composed of men with deep convictions about the program and men not at all hesitant to use the relative autonomy given them under the T.V.A. Act to make the program succeed.

During T.V.A.'s formative years, these men stubbornly resisted all efforts to encroach upon the responsibilities vested in them, and so divide up and confuse the decision-making process. (In the very early days, for example, they resisted an idea that T.V.A. should be a bureau of the Department of Interior.) They were never inclined to make easy concessions in order to avoid the joining of issues, and were notably immune to myriad pressures of particular groups to force a modification of activities or changes in the character of the program.

Quality of staff is another distinguishing characteristic of the T.V.A. Good men were attracted by the challenge of the program in the very beginning, and many stayed to build careers there. Few organizations, public or private, can match the *esprit de corps* of the T.V.A. staff. It is a tough, hard hitting and capable group.

Power Policies

T.V.A. is directed by law to charge the lowest possible rates for electricity in order to achieve the widest possible use, particularly among farm and domestic consumers. In the distribution of T.V.A. power, T.V.A. was to give preference to nonprofit agencies such as municipal electric systems and rural electric cooperatives; power could be sold directly by T.V.A. to the ultimate consumer, but this method of operation was not intended to prevail to any great extent. Power could be sold to privately owned utilities but only on condition that it could be with-

drawn later, in the event the preference customers required it.

The proper interpretation of what Congress wanted can be made only in the light of conditions that existed in 1933. The electric utility industry had been investigated by the Federal Trade Commission. Scandals had been uncovered that indicated a callous disregard for the public welfare. Electric rates were exorbitant. Retail rate structures and sales policies discouraged the use of major appliances in the home. Farm electrification was virtually nonexistent; what is equally important, the utilities maintained that farm electrification was not feasible.

To provide an immediate market for power from Wilson Dam at Muscle Shoals, T.V.A. made contracts with a few industries that could use a combination of primary and secondary power. To implement the preference provision of the Act, T.V.A. also entered into wholesale power contracts with municipalities. The earliest wholesale customers were cities like Tupelo, Mississippi, that long had operated municipal systems but which found it more economical to buy electricity from T.V.A. than to continue to generate it themselves. To demonstrate that farm electrification was feasible, T.V.A. built rural lines in selected areas around Wilson Dam and served these areas at retail. Having demonstrated that rural lines could be built inexpensively and that it was economically feasible to sell power to rural and farm areas at low rates, T.V.A. assisted the local people to organize rural electric cooperatives. The cooperatives purchased the distribution facilities and became wholesale customers of T.V.A. The rural electric cooperatives in the T.V.A. area were the prototype of the cooperatives financed by the Rural Distribution Administration throughout the entire nation.

Early Years

For the first six years of its operation, T.V.A. was deeply involved in litigation brought by privately owned utilities contesting T.V.A.'s constitutionality.

Certain properties of privately owned utilities had been purchased prior to 1939 by municipal electric systems, rural electric cooperatives, and T.V.A., but a decision by the Supreme Court in 1939 paved the way for the acquisition of the major utility properties in the region. T.V.A. purchased the generating and transmission facilities and locally owned systems purchased the distribution facilities.

Today, in the T.V.A. area there are 99 municipal electric systems, 51 rural electric cooperatives and two small private companies that purchase power at wholesale from T.V.A. In 1933, there were only 275,000 electric customers in the entire 80,000 square miles now served with T.V.A. power; today, the 152 local electric systems serve 1.5 million customers, nearly half of whom are located in rural areas. T.V.A. itself serves directly only two dozen industries and federal agencies.

During these early years, T.V.A. power was generated almost exclusively at hydroelectric plants. The multipurpose dams constructed primarily for navigation and flood control were able to provide all of the power that was needed despite the rapid growth in use which resulted from low rates and aggressive promotion by T.V.A. and the municipal and cooperative distributors.

Construction

The invasion of Poland in 1939 increased the tempo of construction by T.V.A. At one time (1942) T.V.A. had 12 dams and one steam plant under construction; peak employment in the agency was 42,000.

T.V.A. began the war (1940) with generating capacity of less than a million kilowatts and at the end of the war (1945) had more than 2.5 million kilowatts. The rapidity with which T.V.A. was able to complete additional capacity represented both a marvel of construction and a tremendous contribution to the success of the nation's war effort. The aluminum industry was able to expand its production for the manufacture of planes as rapidly as it did only because T.V.A. could add capacity rapidly; the Oak Ridge plant of the Atomic Energy Commission was located in the T.V.A. area because a large supply of power could be made available in the shortest possible amount of time.

Few Conflicts with Private Power

During the war, opposition to T.V.A. by privately owned utilities was relatively quiescent. Its market area was generally settled, and relationships with neighboring utilities were good from an operating standpoint. Extensive interconnections had been made among the systems for the exchange of power for the mutual advantage of all. During the severe drought that struck the entire southeast in 1941 and reduced hydro-generating capacity, T.V.A.'s extensive transmission system and its interconnections were used to transfer power from regions of surplus to regions of shortage so the defense production would not be slowed unnecessarily.

Era of Greatest Development

Throughout the country, the use of electricity has grown faster since the end of World War II than in any previous period. The recession which had been expected to take place with the end of wartime production was limited to a brief period of readjustment.

In the T.V.A. area, the power requirements of new and expanding industry have been substantial but not phenomenal. The fastest growth has been in the residential and farm use of electricity and in the power requirements of federal defense agencies.

In 1957, the power requirements of the T.V.A. area exceeded 61 billion kilowatt-hours. This compares with only 1.5 billion kwh for the identical area in 1933 and with 11.5 billion kwh in 1945, the last year of the war.

More than half of T.V.A.'s power output is used by the federal government, primarily by plants of the Atomic Energy Commission at Oak Ridge, Tennessee, and Paducah, Kentucky. Altogether, government installations used 32 billion kilowatt-hours of T.V.A. power in 1957. In comparison, total sales in the highly industrialized state of Pennsylvania during 1956 were 34 billion kilowatt-hours.

The homes and farms in the T.V.A. area used 8.25 billion kilowatt-hours last year; all of the homes in the same geographical area in 1933 used barely 130 million kilowatt-hours. Where there were only 225,000 electrified homes and farms, there are now more than 1,300,000. Where the average home used only 600 kilowatt-hours a year, the average is now more than 6,300. This combination of six times as many customers and ten times greater use per customer results in a 60-fold increase in total residential use.

Growth in the use of electricity by the businesses and industries of the T.V.A. area has also been substantial. These consumers used 16.75 billion kilowatt-hours last year—about 13 times the use for these purposes in 1933. Despite this very substantial growth, industrially the region still lags behind the rest of the nation and behind the region's potential. Low-cost power does not seem to be the overwhelming attraction for industry that some critics of T.V.A. have claimed. A few very large power consumers, such as the aluminum and chemical plants, came to the T.V.A. region largely because of the electric rates just as they went to other areas of low-cost power. But for the majority of industries, cost of power is but one of many factors taken into account in plant location studies.

Steam Plant Construction

Soon after the end of the war, T.V.A. requested appropriations to build a steam plant at Johnsonville, in West Tennessee. Although a steam plant at Watts Bar had been authorized and built during the war to supply power to defense industries, the Johnsonville plant was the first one proposed by T.V.A. to meet the normal peacetime requirements of the area—requirements which were beginning to outstrip the huge hydro-electric capacity and potential of the region. The Johnsonville request pinpointed as nothing had before the question of T.V.A.'s continuing responsibility for power supply.

Since 1939, when T.V.A. and the municipal and cooperative distributors bought out the properties of the privately owned utilities in the area, T.V.A. had been the sole producer of power for public supply in the entire region. It was T.V.A.'s position that sound economics, sound engineering and

modern utility practice dictated that the region should continue to have one integrated system for the generation and transmission of electric energy.

Funds for the Johnsonville plant were denied by the Eightieth Congress, but after a battle in the Congress the following year, the plant was authorized. Subsequently, six more steam plants were authorized and built. One of these, near Kingston, Tennessee, is, as far as is known, the largest steam-electric station in the world. Another, near Paducah, Kentucky, is a close second. Total steam plant capacity in the system as of June 30, 1957, was greater than the capacity in the dams: 6,287,250 kilowatts in steam, 3,602,235 in hydro.

The Dixon-Yates Episode

In the fall of 1952, in its budget for the 1954 fiscal year, T.V.A. recommended a new steam plant at Fulton, Tennessee, near Memphis. This proposal was approved by the Truman administration and was being considered by Congress when the Eisenhower administration took office. In a general review and revision of the Truman budget by the new administration, all funds for beginning construction of power facilities by T.V.A. were eliminated. The reason given by the Bureau of the Budget was that T.V.A. had over-estimated the power needs of the area, a charge which had been made by the private utilities almost every year since 1933, and a charge which time and future events had consistently proved to be wrong.

Over the next few months the need for more capacity became increasingly evident, and in the fall of 1953, T.V.A. again recommended the Fulton steam plant. Meanwhile, the private utilities, convinced that growth of the T.V.A. system could now be halted, had made various public suggestions for alternative methods of meeting the needs of the region. These suggestions included sale of the power facilities to private investors, contraction of the service area which had been established in 1939 as existing supply contracts expired, (with the utilities moving into the area or the various cities building their own plants), and purchase, by T.V.A., of any new power requirements from neighboring systems.

In December, 1953, T.V.A. was told by the Bureau of the Budget that instead of new capacity on the T.V.A. system, the President's budget message would call upon the Atomic Energy Commission to seek an outside source for a block of power which T.V.A. had contracted to supply to the A.E.C.'s Paducah plants; the idea being that if T.V.A. were relieved of part of the A.E.C. load, the power could be made available to other customers. T.V.A. could of course have no objection if A.E.C. wanted to cancel part of its power contract and T.V.A. had a market for the power elsewhere; but as the arrangements developed for this alternate power source gradually became known, the T.V.A. Board (the members of which were holdovers from the previous administration) objected with all the force at their command.

Analysis of the Dixon-Yates scheme, (so-called from the names of the heads of the utility companies which were to form a new group and construct the plant) showed that it would be substantially more expensive to the government than adding capacity to the T.V.A. system. At one stage, figures developed by the Bureau of the Budget and A.E.C. showed that the excess costs to the government would amount to about $3.3 million per year. T.V.A.'s figures put the excess annual cost at $5.5 million.

The new power was to come from a plant at West Memphis, Arkansas, across the Mississippi from Memphis, Tennessee. Construction of the plant was to be underwritten by a long-term power contract with the government. The power was not to be delivered directly to A.E.C., but was to be fed into the T.V.A. system at Memphis, with T.V.A. delivering a comparable amount of power to A.E.C. at Paducah.

The T.V.A. Board and the municipal and cooperative distributors of T.V.A. power were convinced that in the final analysis, T.V.A. would wind up paying the excess costs; that the real purpose of the arrangement was to force higher cost power into the T.V.A. system and by this means break the low rate structure in its service area. The record, as subsequently developed in

testimony before the Congress, lends much support to this point of view.

When it became apparent that the administration was determined to proceed with the Dixon-Yates arrangement, the City of Memphis announced that, rather than depending, even though indirectly, upon this source of power, it would build its own municipal plant, and would not ask for a renewal of its power contract with T.V.A. when that contract, entered into on November 23, 1935, expired on June 1, 1958.

It was on this basis that the immediate issue of the Fulton steam plant versus Dixon-Yates was settled. The City of Memphis will no longer depend on T.V.A. for its basic power supply, and the government has cancelled the Dixon-Yates contract.

T.V.A. and the City of Memphis have signed a power interchange agreement to become effective when the 700,000 kilowatt Memphis plant is completed. The contract is similar to interchange arrangements T.V.A. has long had with neighboring private utilities, and it should help the economics of the Memphis operation. But the Memphis solution is not an answer to the problem of the smaller cities and cooperative distributors of the region, who continue to look to T.V.A. to fulfill their requirements.

Financial Operations and Future Financing

T.V.A.'s power operations are big business. Its operating revenues in fiscal year 1957 amounted to $236 million. Its net income, after operating and maintenance expenses, depreciation and the payments in lieu of taxes provided for by law, amounted to $58 million. This amount of income, applied to the average investment in power facilities during the year ($1,470,000,000) results in a four per cent rate of return. A four per cent return is modest in relation to earnings allowed private utility companies by regulatory commissions, but substantial in terms of the objectives of the program as set forth in T.V.A.'s basic legislation.

T.V.A. must continue to build generating capacity if it is to keep ahead of the power requirements of its service area. The amount of capital needed for expansion is large—in the order of $150 million a year. How this capital is to be raised is a question before Congress as this article is written. The bulk of the present power investment came from funds appropriated by Congress. In recent years, there has been a decided reluctance on the part of the administration and Congress to appropriate money for additional generating units. Some additions have been financed from power revenues, but T.V.A. is required to repay the investment made from appropriations over a period of 40 years. It cannot, any more than a growing private utility, pay off its indebtedness and still meet its new capital requirements out of current revenues.

Late in 1957, the Senate passed a bill that would authorize T.V.A. to sell revenue bonds to aid in financing power facilities. In March, 1958, this bill was before the Public Works Committee of the House of Representatives. It has had vigorous opposition from private utilities, the United States Chamber of Commerce and other groups. Interestingly enough, during the years when T.V.A. relied upon appropriations, these groups recommended specifically that the agency get its money in the bond market. Now that bond financing is near to becoming law, there is fear that access to this source of capital funds would give T.V.A. too much freedom to expand the size of its plant.

The financial legislation is crucial to T.V.A. and to its service area. The Valley region can continue to grow only with growth of an assured capacity of electric energy. If T.V.A. cannot supply that energy, other devices must be found. For a full quarter of a century, the power facilities of the region have been engineered and designed on the basis of one regional system generating and transmitting power to a large number of locally owned and locally operated distribution systems. Any alternative to this arrangement means a loss in engineering efficiency and most likely a substantial increase in electric rates—not only in the Valley area but over the country. The evidence is abundant and clear that the low power rates in the Valley region have influenced the rates and service policies of the nation's utilities just as the T.V.A. example

in large scale farm electrification was followed elsewhere over the nation.

The outcome of the present argument over revenue bonds is in doubt. As indicated earlier, opposition to T.V.A. by the private utilities was relatively quiescent during the war and T.V.A. achieved a very high degree of public acceptance. Shortly after the end of the war, however, there was a resurgence of a violent anti-T.V.A. campaign on a national scale. The immediate cause appears to have been related to a series of public opinion polls conducted by the utilities in which they found that a great majority of Americans in all walks of life and from all political affiliations approved of T.V.A. These polls even indicated that more employees of private utilities approved of T.V.A. than disapproved. To combat this condition, a large scale advertising campaign, with T.V.A. as the target, was launched by, (to quote the ads), "America's Business-Managed Light and Power Companies."

The campaign has been greatly aided by changes in the political climate. In the minds of many, T.V.A. is a showpiece of the New Deal, and it has borne the brunt of the reaction from that era. Early in his first administration, President Eisenhower gave the campaign a boost (perhaps unintentionally) when he made a speech warning of "creeping socialism." When asked in a subsequent news conference to give some examples, he named the T.V.A.

Largely for these reasons, sober examination and evaluation of T.V.A. during the past few years have been overshadowed by reference to doctrine. Many people in the area it serves, convinced that it has been a key factor in the rehabilitation of the region, contributing heavily to the growth of private business, are at the same time a bit nervous over the easy labels which have been applied. Many wish—and understandably—that T.V.A. could continue with its work, but somehow or other cease to be a matter of controversy.

This, in view of the subject matter with which T.V.A. is perforce involved, would indeed require a bit of doing. Gordon R. Clapp, a former Chairman of the T.V.A. Board, has written:

> TVA will cease to become controversial when it fails to pursue vigorously the purposes for which it was established; when it ceases to be deeply devoted to the public interest; when it gives up its persistent effort to excel in its performance of the tasks assigned to it. Should these changes occur, and the pressures and actions to bring these changes have been unremitting since it was created, its essence as an idea and as a useful instrument of public service will have disappeared. TVA is controversial because it is consequential; let it become insignificant to the public interest, an agency of no particular account, and people will stop arguing about it.

John Oliver *served 12 years with the Tennessee Valley Authority where he held the post of chief budget officer and later became general manager (1951-1954). He is currently associated with the Development and Resources Corporation, a company that provides advisory assistance, primarily overseas, in the development of natural resources.*

"During the next few months, the [International Atomic Energy] Agency . . . will be planning its program for the future. It will look into the possibility of turning atomic energy into a source of power.

"It will seek to advance knowledge of the application of radiation and radio isotopes in medicine, industry and agriculture.

". . . It will provide technical assistance to its members.

"It will promote the development of nuclear reactors for peaceful purposes.

"It will assist in the exchange and training of scientists and experts.

"And, finally, it will set up a system of safeguards designed to insure that fissionable materials made available by the Agency are not used in such a way as to further any military purpose."

—Francis O. Wilcox, Assistant Secretary of State for International Organization Affairs, *The United Nations: Force for a Better World*, October 28, 1957.

"Since many of the principal factors of the national power isues were also involved in the Muscle Shoals controversy, that project became one of the most important battle grounds of the national power fight." A specialist traces the controversies underlying . . .

The Story of Muscle Shoals

By Preston J. Hubbard
Assistant Professor of History, Austin Peay State College

The creation of the Tennessee Valley Authority in 1933 marked a decisive turning point in an important area of American public policy. Not only did the passage of the Tennessee Valley Authority Act mean that the American people had acquired a new and more effective instrument for the regulation and control of the private power industry, it meant that the federal government had been committed to a vastly larger role in the development of the nation's power resources. Above all, however, it meant a decisive victory for the principle of public power. This bold departure from established policy was not a decision arrived at overnight; it developed out of a long struggle over the disposition of the federal government's defense project at Muscle Shoals, constructed during World War I.

The National Defense Act of 1916 had provided that the Muscle Shoals nitrate plants were to be used by the government in peacetime for the production of nitrates for fertilizer and national defense. When the Wilson administration attempted to put this mandate into effect during the post-war period, Muscle Shoals became involved in a dispute over public versus private operation.

The most important aspect of the government's defense plant at Muscle Shoals was that of water power. The project had been located at Muscle Shoals because of the vast potential water power available there, and when the war ended, the government had made a large investment in the construction of a huge hydroelectric dam across the Muscle Shoals rapids. The dam, however, had not been completed. The possession of this dam by the government had important implications for the future of American power policy. The dam itself was the key to the water-power resources of the entire Tennessee River system; and the decade following World War I was a time of rapid expansion in the power industry—a development which created complicated interstate power problems. Since many of the principal factors of the national power issues were also involved in the Muscle Shoals controversy, that project became one of the most important battle grounds of the national power fight.

In late 1919, the Wilson administration drew up a plan for the peacetime fertilizer program described in the National Defense Act. This plan, authored by Secretary of War Newton D. Baker, was introduced to Congress as the Wadsworth-Kahn bill. The Baker plan provided for the production of fertilizer at Muscle Shoals by a government corporation. The power not needed in the manufacture of fertilizer would be sold at the switchboard to private power companies. Baker's embryonic idea of a government corporation at Muscle Shoals, nurtured and developed for a decade by Senator George W. Norris, eventually was to reach maturity in 1933 as the Tennessee Valley Authority.

The Wadsworth-Kahn bill was ardently supported by most of the existing farm organizations because it was expected to result

Preston J. Hubbard *joined the faculty at Austin Peay State College in September, 1955. His doctoral dissertation was written under the direction of Dr. Dewey W. Grantham. As yet unpublished, it is concerned with "The Muscle Shoals Controversy, 1920-1932: Public Policy in the Making."*

in the production of cheap fertilizer. On the other hand, the Republican majority in Congress bitterly opposed Baker's plan on the ground that it represented an unwarrantable governmental interference with the private enterprise system.

The debate of 1920 in Congress on the Wadsworth-Kahn bill revealed that as yet the issue of public versus private power had not become an important factor in the Muscle Shoals controversy. Instead the government's proposal to invade the private fertilizer industry dominated the consideration of the measure. Baker's plan for a publicly-owned fertilizer plant evoked a general but heated discussion concerning the role of the government in the American economic system, the Republican majority strongly affirming its faith in the principles of classical economics. The debate also revealed that at this juncture in the controversy, the fertilizer aspect of Muscle Shoals was more important than water power. Despite the heavy verbal barrage of the conservative Republicans, the farm bloc carried the bill to victory in the Senate, but it died in the House.

The failure of the Wadsworth-Kahn bill to pass Congress appeared to have stifled any chance for public operation of the Muscle Shoals project. In fact, this turn of events seemed to have sounded the death knell of any further development of Muscle Shoals. The project was, however, too valuable to scrap outright. In early 1921, the newly-inaugurated Harding administration began an attempt to lease Muscle Shoals to private interests. Not until mid-summer was a suitable bid received. At that time Henry Ford focused the attention of the nation on Muscle Shoals by submitting a bid for all of the federal properties there. The Ford offer, which included proposals involving extensive water-power rights, ignited a controversy over power development which was not to be quieted until the passage of the Tennessee Valley Authority Act in 1933.

The Ford Offer Period

The Ford offer for Muscle Shoals was one of the most important issues in Congress from 1921 to late 1924 when the offer was withdrawn. During the early stages of this period, the offer enjoyed tremendous popularity in the nation at large. Because the offer appeared to promise vast quantities of cheap fertilizer for American agriculture and because of the enormous popularity of Ford and his product throughout rural America, the great Detroit entrepreneur had the support of many members of the powerful farm bloc.

The Ford partisans concentrated their publicity efforts on the fertilizer aspects of the offer, for it was support from the farm belt to which they looked for victory; and they minimized the power phases of the offer, for it was the power issue which posed the greatest threat to the success of the offer. The pro-Ford group attempted to convince the American farmer that he was the victim of a fertilizer "trust" which would be broken by an endless supply of cheap fertilizer flowing from Muscle Shoals should the Ford bid be accepted.

The opposition to the Ford offer, which was led by Senator George W. Norris, consisted chiefly of Norris' fellow Progressives and conservationists, administration Republicans, and the power and chemical industries. The Progressives and conservationists opposed the Ford offer because they felt that its grant to Ford of important water-power rights in the absence of public regulation was a serious violation of established national policy and of their political creed. The Republican administration desired to leave the project to the private power industry.

Senator Norris made a vigorous effort to make it clear to Congress and the nation that the Ford offer primarily concerned water power rather than fertilizer. He attempted to show that the Ford offer contained no binding pledge to manufacture fertilizer, and he assembled a vast array of scientific evidence in an attempt to prove that the technological process which Ford proposed to use to produce fertilizer was obsolete. During the Ford offer period, Norris mustered an imposing amount of scientific data that strongly suggested that the cyanamid-process plant at Muscle Shoals, which Ford proposed to use, was obsolete. Norris asserted that Ford was using a "cheap fertilizer" scheme as a subterfuge in order

to grab the power in the waters of the Tennessee. Thus Norris insisted that Muscle Shoals was primarily a water-power proposition, and that fertilizer production at the project should be limited to research programs.

During the early stages of the Ford offer period, Ford received almost solid support from the economic groups in the South. Ford's offer, however, contemplated the concentration of Muscle Shoals power for the benefit of Ford-owned industries in the Muscle Shoals area. As Senator Norris continued his attempt to educate the nation regarding the importance of Muscle Shoals to the nation's power policy, Southern civic and industrial leaders, who were attempting to attract industry to their communities, came to believe that their industrial growth depended on gaining access to cheap power from the Tennessee River, a goal which the Ford offer threatened to deny them. They also feared that Ford, by securing an uncontrolled monopoly of Muscle Shoals with its cheap water power, would drive many industries in the South to bankruptcy through unfair competition, for Ford had hinted that he would manufacture a number of products at Muscle Shoals not directly related to automobiles.

Thus, some of these Southerners came to view the Ford offer as a menace to the South. During the latter stages of the Ford offer period, this disgruntled group deserted Ford and joined the opposition, though there was little defection from the ranks of pro-Ford Southerners in Congress, because the fertilizer issue, as expounded by the Ford partisans, continued to hold great charm for Southern agriculture.

The attack by Senator Norris on the Ford offer was centered primarily on the contention by Norris and others that the proposal was contrary to basic public policy as adopted by Congress in the Federal Water-Power Act of 1920. By 1924, many Southerners who desired to obtain cheap Muscle Shoals power for local communities had begun to realize the importance of regulation of the development of the nation's water-power resources. Hence, this group developed a healthy respect for the Federal Water-Power Act.

The attempt by Ford to concentrate Muscle Shoals power for his own benefit also struck a blow at the private power industry. Therefore, this industry, which previously had opposed effective federal regulation of water-power development, became one of the primary defenders of the theory of public regulation. The threat afforded by the Ford offer forced the power companies to support the water-power law, for only through its defense could they adequately defend themselves.

The concentration-of-power principle embodied in the Ford offer threatened the very existence of the power companies because it proposed to relieve them of their function of distributing power. Moreover, the power industry, in its fight against the Ford offer, found the Federal Water-Power Act to be a convenient robe with which to clothe itself with respectability, a factor which would be helpful to the industry in its fight against the growth of public power. Thus, the struggle between the pro-Ford group and its adversaries served to strengthen the Federal Water-Power Act by increasing public respect for public regulation.

Soon after he had submitted his offer, Ford and his supporters executed several well-timed and dramatic maneuvers in an effort to force early congressional action on the matter. Ford partisans expected a quick victory in Congress. Although the Ford group failed to achieve this goal, Ford's offer was accepted by the House of Representatives in 1924. A study of the Muscle Shoals controversy during this period offers convincing evidence that the Ford offer would have carried Congress but for the political genius of Senator George W. Norris.

Norris, alert to every turn in the strategy of the Ford party, kept Ford's bid bottled in the Senate Agriculture Committee while he stimulated and welded together all possible opposition to Ford's plan for Muscle Shoals. The Nebraska senator sought, and with much success, to achieve a deadlock by pitting two great economic powers against each other—Ford and the power industry. By the time Congress had adjourned in the summer of 1924, the tide had turned against the Ford offer, both in and out of Congress, and the Muscle Shoals project as well as the

Tennessee River was saved for public development.

Despite the fact that Norris was working in harmony with the conservative Republican administration and the power companies in his effort to prevent Muscle Shoals from falling into the hands of Ford, the Nebraska senator was at the same time promoting a plan of his own for public development of Muscle Shoals and the Tennessee River. By the end of the Ford period, Norris had developed a mature plan which called for unified, multiple-purpose development of the Tennessee River system. This Norris plan was later to become the basis of the Tennessee Valley Authority Act.

The second Norris Muscle Shoals bill introduced in 1924 reflected the great amount of time that the Senator had consumed in his deep and thorough study of the intricacies of the public versus private power question, the science of nitrates and fertilizer compounds, navigational possibilities of the Tennessee River system, and other related problems. Norris was greatly influenced by his study of public power in Canada. Despite these elaborate preparations, the Nebraska senator found little support for his bill during this period, except for support from his fellow Progressives.

During the early 1920's, a plan for public power could make little headway in the face of the Harding-Coolidge philosophy of *laissez faire*. Another important obstacle confronting the Norris bill at this point was the concept of Muscle Shoals as primarily a fertilizer plant.

The Post-Ford Period, 1925-1928

In October, 1924, Henry Ford withdrew his Muscle Shoals offer from Congress. During the next three years, a group of power companies vigorously battled a combine of chemical interests for control of Muscle Shoals. The American Cyanamid Company, which headed the chemical combine, played a role similar to Ford's in that the cyanamid company's bid also contemplated the concentration of power at Muscle Shoals and strongly emphasized the production of fertilizer for farmers. During the first part of this period, the power companies dominated the controversy, but the cyanamid company became the leading contender by 1927. Since the cyanamid company's bid proposed concentration of power without public regulation, the Federal Water-Power Act continued to play an important role in the controversy. In fact, most of the issues that were important factors during the Ford-offer period continued to dominate the controversy during the post-Ford period.

On the other hand, there were some important new developments during the post-Ford period. Several Southerners in Congress who had supported Ford's bid joined the Norris camp following Ford's withdrawal. This group included Senator McKellar of Tennessee. The Norris public power aggregation thus became strong enough to play an effective balance-of-power role though still too weak to be a serious contender. Norris utilized his newly-found power very effectively, joining forces with the cyanamid company when the power companies were in the ascendancy and vice versa.

On several occasions during this period, political maneuvering revealed that the farm bloc in the Senate would favor a public power bill for Muscle Shoals if it had the support of some additional Southerners. One by one the Southerners, who were still strongly influenced by the belief that Muscle Shoals should be allocated to fertilizer production, joined the Norris forces, but it was not until 1928 that Norris could count on a solid South.

Another dramatic development during this period concerned water power. During 1925 the Corps of Engineers, who were engaged in a comprehensive survey of the Tennessee River system, began to reveal the tremendous amount of water power that could be obtained from a coordinated development of the river. After 1925, all contenders in the controversy contemplated at the least a partially unified development of the power resources of the river. Norris, however, had proposed a unified, multiple-purpose program of development. By the end of 1925 it was evident that the stakes in the controversy included the whole Tennessee River basin.

This increasing emphasis on water power, together with the withdrawal of the Ford

party, which had attempted to minimize the importance of water power at Muscle Shoals as compared to fertilizer, tended to make the issue of public versus private power more important in the post-Ford period than in the previous period when Ford dominated the scene. Early in the post-Ford period, Norris declared that the controversy had simplified itself into a contest between the "power trust" and public power. But during the latter part of the period, the powerful surge of the American Cyanamid Company's bid, which was actively supported by the Farm Bureau, tended to confuse the power issue to some extent.

In the spring of 1928, the Norris Muscle Shoals bill was adopted by Congress, although it was formulated as a compromise which provided for only limited power development. The victory of the Norris public power proposal was surprising in view of the strong anti-public power sentiment in the nation during the early 1920's.

Some of the principal reasons for this political upset can be readily explained. In the first place, it was a compromise bill which would entail much less expenditure than the comprehensive Norris proposal. This permitted some economy-minded members of Congress to support the measure. More important, the great majority of southern Democrats in both houses of Congress finally came to accept the Norris plan. Many of these Southerners previously had supported only private-leasing bills. The strength of the practically solid South, combined with farm-bloc and progressive Republicans, was overwhelming.

Furthermore, both major private contenders for Muscle Shoals had by 1928 sustained somewhat tarnished reputations. Senator Norris had bent every effort in an attempt to show that the cyanamid company was using promises of cheap fertilizer for farmers with no binding commitment as a pretext for grabbing the water power of the Tennessee River.

On the other hand, Norris and his fellow advocates of public power had instigated an investigation of various aspects of the private power industry. Indications of irregularities in the power industry produced reactions favorable to public power. The victory of the Norris bill was short-lived, however, for it was killed by a pocket veto by President Coolidge following the adjournment of Congress in 1928.

After the election of 1928, the Federal Trade Commission destroyed any hope for the power companies' Muscle Shoals offer by showing that the private power industry had reached a stage where it appeared to be threatening the ability of public regulatory commissions to control power companies. Thus the Norris idea, that a public power project at Muscle Shoals could be used as a yardstick for regulating the power industry, grew in popularity.

In early 1930, a Senate lobby-investigating committee headed by Senator Caraway of Arkansas squashed the hopes of the other strong contender for Muscle Shoals, the American Cyanamid Company. The lobby committee, which revealed what appeared to many people to be an unethical relationship between the cyanamid company and the Farm Bureau, seriously impeached the motives underlying the cyanamid company's offer.

The final report of the Corps of Engineers on the survey of the Tennessee River contributed to the victory of public power in the Muscle Shoals controversy. This report, which was issued in 1930, demonstrated the wisdom of unified, multiple-purpose development of the river, a program which had been advocated chiefly by supporters of public power.

The increase in size of the public power group in Congress, together with the developments described above, resulted in another victory for the Norris bill in Congress in 1931. This bill was vetoed by President Hoover. Following the veto, President Hoover presented a private-leasing plan for Muscle Shoals, but by this time the Norris public power plan was in the ascendancy in Congress. The victory of Franklin D. Roosevelt and the Democratic party in 1932 assured passage of the Norris Muscle Shoals bill. When in May, 1933, the new Congress enacted the Norris Muscle Shoals plan into law through the Tennessee Valley Authority Act, more than a decade of strife and uncertainty over the disposal of Muscle Shoals and the Tennessee River came to an end.

For a time it looked as if "the fight over developing the Niagara might go on forever." After a long controversy, the development is under way; by the spring of 1961, it should be the world's third largest hydroelectric project.

The Niagara Compromise

By William E. Leuchtenberg
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In March, 1950, the American Secretary of State, Dean Acheson, and the Canadian Ambassador, H. Hume Wrong, signed their names to a treaty which ended a minor controversy and launched a major one. For more than 50 years, the great cataract of Niagara Falls has been associated in men's minds with hydroelectric power. It was here at the turn of the century that the Niagara Mohawk Power Company built the first great hydroelectric plant in the world. Concerned lest power development harm one of the world's foremost scenic attractions, Congress in 1906 passed the Burton Act preserving the Falls and limiting the amount of water that could be diverted for power production. Three years later, the United States and Canada negotiated the Boundary Waters Treaty, regulating the diversion for power purposes of water above the Falls.

Over the next four decades, both countries took steps to protect the scenic beauty of the Falls, but no permanent policy was worked out. Most of the power potential remained undeveloped. During World War II, water was diverted temporarily to meet war demands for power, and in the postwar years, when demand for power greatly increased, steps were taken to negotiate an agreement for a permanent division of Niagara's waters. Under the 1950 treaty, at least half the river's flow must be reserved for the Falls during the summer tourist season. From November 1 to April 1, only half as much has to be saved for the Falls; the remainder may be used to generate power, save when the water is needed to flush ice. The two nations agreed further to build submerged dams to preserve an unbroken crestline at the Falls. All the water not needed for scenic purposes was divided equally between the two countries.

The hydroelectric potential of the Niagara site is nearly six times as great as that of Hoover Dam. In 1950, companies on both sides of the border were producing 10 billion kilowatt-hours annually. The treaty made possible the generation of another 23.1 billion kwhrs, divided equally between the United States and Canada. When completed, the Niagara development will be the largest international hydroelectric project in history.

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The 1950 Treaty

The treaty resolved any possible conflict of interest between Canada and the United States, but it precipitated a rousing new battle over who would develop America's share of the power. Of the seven plants already at the site, the Niagara Mohawk Corporation owned three, two in the United States, one in Canada. It was assumed that Niagara Mohawk would develop the new power until New York's Senator Herbert Lehman—a veteran of the power war of the New Deal years—inserted an unusual clause in the treaty. Lehman's amendment gave Congress (rather than the Federal Power

Commission) the right to determine who was to exploit the Niagara site, and provided that the Falls must be developed "for the public use and benefit."

"Public Use and Benefit"

No sooner was the treaty approved than Lehman drafted a bill calling for federal construction of a generating plant at Niagara. Lehman contended that the "public use and benefit clause" in the treaty barred the possibility of private development. The Lehman bill, sponsored in the House by Representative Franklin D. Roosevelt, Jr., further provided that the federal government would turn the project over to the New York State Power Authority to operate, with the stipulation that municipally-owned utilities and R.E.A. co-operatives be given preference in the purchase of power.

The Lehman bill created consternation among the private utilities, for it marked the boldest advance yet made by the federal government in the power field. Although the government had built power projects for several decades, its authority had always been based on the argument that power generation was incidental to other purposes like flood control or reclamation or that federal operation was needed to preserve unified development of the valley. No such argument applied to the 36-mile-long Niagara river. Moreover, federal power agencies had never had a foothold in the Northeast before. With the companion St. Lawrence project, government development of Niagara Falls threatened the utilities with the possibility of a new federal power empire in the Northeast.

Capehart-Miller Bill

President Truman announced he was strongly in favor of government development; during his administration, opponents of federal construction were forced to fight a rearguard action. Representative William Miller, Buffalo Republican, filed a bill for private exploitation of the site by the Niagara Mohawk Corporation, joined by Consolidated Edison, Central Hudson Gas and Electric, New York State Electric and Gas, and Rochester Gas and Electric. The private companies, apparently demoralized by Lehman's maneuvers, gave Miller little support, and it was only at the last moment that Miller could get Homer Capehart of Indiana to agree to sponsor the bill in the Senate. In the Fair Deal atmosphere of the Truman administration, the Capehart-Miller bill did not stand a chance.

The Ives-Cole Bill

More important was a bill introduced by Senator Irving Ives, New York Republican, authorizing development of the Niagara site by the New York State Power Authority. In 1951, the Republican-controlled New York state legislature had empowered the New York State Power Authority (created in 1931 during Governor Franklin Roosevelt's reign) to build and operate the Niagara project. The Ives-Cole bill was rejected by most liberals since it did not contain a "preference clause" requiring non-profit agencies to get first crack at the purchase of power. But since the bill provided for public development, although by a state agency, it split the ranks of the Lehman supporters, and helped stymie the Lehman bill.

In 1952, the Republicans won national power for the first time in a generation, and the utilities now took the offensive. The Ives-Cole bill was dropped. Cole anounced that he had never liked his own bill, and that he had filed it only to stop Lehman. Ives was importuned to reintroduce his bill "by request"; by implication, he did not care whether it passed. Confident of total victory, the private interests massed their battalions behind the Capehart-Miller bill, now sponsored by Representative Dondero, Michigan Republican, as well.

Thrown on the defensive, Lehman and Roosevelt announced that they were willing to compromise. So long as there was public development, they did not care whether it was done by the federal or the state governments, provided that the bill contained a preference clause. By 1953, all hope of federal development had ended. From then on, the fight centered over whether the private companies or the State Power Au-

thority would exploit the site, and over whether the bill would contain a "preference clause." Since the forces were evenly divided, the battle raged for four more years —from 1953 to 1957. When the Capehart bill passed the House in 1953, Lehman was able to kill it in the Senate. When the Democrats won back control of Congress, and Lehman's bill passed the Senate, the Republicans were able to stall it in the House.

Pro and Con

In favor of the Capehart bill were the private companies, who had the benefit of financial backing from utilities across the nation. They also had the support of the New York State Association of Electrical Workers, A.F.L.-C.I.O., who opposed the Lehman bill as one "which seriously threatens free trade and the American system of free enterprise." "Past experience," the union argued in a full-page ad in a New York newspaper, "shows that fair and lasting labor agreements with government agencies are almost impossible." In support of Lehman's demand for public development and the preference clause were the R.E.A. co-operatives, the New York Farm Bureau Federation, the Farmers Union, and most of the C.I.O. and A.F.L. unions.

Governor Thomas Dewey and the New York Republicans held the crucial middle ground of favoring public development, but opposing the preference clause. New York State leaders of both parties, no matter what their normal ideological bent, favored public construction and operation. Appearing before the Senate Public Works Committee, Robert Moses, Chairman of the New York State Power Authority, declared:

> As a conservative in every sense, I give you my considered conviction that any business interests or political party which attempt to hand over the Niagara to the five private utility companies, and the coal companies back of them, will not survive long in our state. . . . The five companies chatter about "free enterprise." Granting New York's rights in Niagara to power and coal companies is not free enterprise. It is robbery.

Governor Dewey, whose views Moses expressed on this occasion, strongly opposed the Capehart bill with the warning that the utilities would get a six per cent return "on all they could borrow, beg or steal" to invest in the project. Declaring that his stand for public development was in the tradition of Teddy Roosevelt, Charles Evans Hughes and Herbert Hoover, Dewey proclaimed: "If this is socialism, I will be glad to stand at the dock with my distinguished defendants."

A Preference Clause

When it seemed clear that the forces in favor of public development would win out, the main fight shifted to the preference clause. Since the days of Theodore Roosevelt, the federal government's policy had been to give preference to public bodies like municipal electric plants in the sale of power from projects built with government funds. Opponents of the "Power Trust" argued that it was unfair for the federal government to build huge plants with taxpayers' money only to have private utilities buy all the power and make a profit on transmitting and distributing it. Moreover, supporters of the preference clause contended that by providing the competition of low public power rates, it would force the private companies to cut sharply their inflated rates. Since the 1930's, the preference clause has applied as well to the "R.E.A. co-operatives" —agencies organized by farmer co-operatives with money borrowed from the Rural Electrification Administration to bring electricity into rural areas. The applicability of the preference clause to the Niagara project was complicated by the fact that if the State Power Authority built the plants no federal funds would be used. Moreover, neither R.E.A. co-ops nor municipal plants were strong enough in the region to consume the major share of the power. Nevertheless, although he was willing to yield to Dewey's proposal for state development, Lehman refused to back down on the cardinal principle of the preference clause.

By the spring of 1956, six years after the treaty had been signed, it appeared that the fight over developing the Niagara might go

on forever. Canada had already constructed its plant—a project undertaken by the publicly-owned Ontario Hydroelectric Commission—and it was using not only its own water but also some of the American share, which under the treaty it had a perfect right to do. Every day, water to produce thousands of kilowatt-hours of electricity went out to sea. Each year the United States was losing $17 million in power. Even more important, some two dozen electro-metallurgical industries in the region, operating 24 hours a day, desperately needed more electric power.

A Forced Decision

In June, 1956, a rock slide badly damaged the Niagara-Mohawk's Schoelkopf plant, and brought the Niagara debate to a crisis. The American electro-metallurgical industries were now forced to buy expensive power from Canada. Forced to cut back production if they could not obtain more power, many of the industries threatened to leave the region. It was obvious that a compromise had to be reached.

Kerr's Compromise Bill

The man who achieved the compromise was Oklahoma's Senator Robert Kerr. In August, 1957, a little over a year after the avalanche, Congress adopted, and President Eisenhower signed, Kerr's compromise bill, bringing the seven year fight to an end. Although it was a compromise, the bill was actually a singular triumph for Senator Lehman, for it preserved the principle of public development, and preserved, in part, the preference clause. Under the act, sponsored by New York's Senators Ives and Javits, the New York State Power Authority will build and operate the plant. No federal funds will be employed; the project will be financed by a State Power Authority bond issue. The power produced at the plant will be divided between the private utilities, under contract to pass savings on to consumers, and the public agencies like municipalities and R.E.A. co-operatives. Ten per cent of the power will be reserved for the neighboring states of Pennsylvania and Ohio. Although the Power Authority also has the right to build transmission lines, it is not likely to use it.

The project, which will add one-third to the existing generating capacity of New York State, will be the second largest in the country. Grand Coulee is slightly bigger. The Authority announced it would undertake a $600 million project with a generating plant at Lewiston with a capacity of 1.8 million kilowatts. The Authority's plan called for tapping the Niagara river above the rapids and carrying water to Lewiston through twin tunnels. The tunnel or conduit system would double the "head" of the project—that is the distance the water drops before reaching the turbines.

Opposition from New York

No sooner was the bill signed than the Niagara project ran into a new and astonishing variety of obstacles. On August 26, 1957, the officials of Niagara Falls, of the town of Niagara, and the town of Lewiston requested the Federal Power Commission to hold public hearings before granting a license to the State Power Authority. The Authority proposed to take water to the plant by an open canal through the countryside and by twin conduits which would be covered when they passed through the City of Niagara Falls. The conduits—each as wide as a 4-lane highway—would be 65 feet deep as they passed through the city. The petitioners protested that the conduits were too close to the surface.

Incensed, Robert Moses declared that the changes demanded by the towns would add another $100 million to the cost. He had been planning to break ground on September 12, but said that the demand for hearings would delay the project indefinitely, since no bonds could be sold until the project received a final license. Despite Moses' protest, the F.P.C., on August 29, announced that it would grant the Authority only a conditional license, and that it would hold public hearings. Once more, before a spadeful of dirt was dug, the Niagara project was delayed indefinitely.

This was not the end to Moses' troubles. The City of Niagara Falls demanded reimbursement for the loss of taxable land;

Niagara University asked nine million dollars for its school golf course, which the project would flood; and various individuals and agencies objected that the proposed reservoir was too large. The biggest outcry came from Chief Harry Patterson and the Tuscarora Indians.

The Tuscaroras, one of the original Six Nations of the Iroquois, protested to Washington against the flooding of a large section of their reservation. They claimed that they had been promised by the Government, by solemn treaty, that they could live undisturbed until eternity. If the dam were built, Chief Harry Patterson asserted, this pledge would be broken, and the Indians would be forced to leave the reservation and live under white man's law.

Conclusion

On January 30, 1958, the Federal Power Commission brought the major controversy to an end by granting a final license to the State Power Authority, but on the condition that the Authority build covered conduits from the Falls to the plant. Moses, angered by the decision, said it would add $25 million to the cost of the project. However, he added, since unemployment was mounting in the area, he would not delay matters further by taking court action. After treating his opponents to some familiar invective, Moses announced that he was accepting the F.P.C. license "reluctantly." Earlier in the month, the F.P.C. approved the Authority's plan for a 2400 acre reservoir, and ceded its right to condemn the property of the Tuscaroras for part of the reservoir. Engineers are busy at work; bids have been let; and by the spring of 1961, the first power is expected to flow.

Although the Niagara project is the third largest in the world, almost all the power will be consumed in the immediate region of Niagara Falls. As big as the plant is, the economic expansion of the country is proceeding at such a pace that three years after the Niagara plant is finished, there will be a new power shortage in the Niagara Falls area.

The Atomic Energy Commission "is an organization created without a pattern, administering its awesome duties by techniques not before tried, and executing economic policies for which no label has been yet contrived." This able and comprehensive discussion of the development of nuclear power clarifies the problems and the criticisms of the A.E.C. Americans should remember, writes this specialist, that "nuclear energy has many uses, but the reconstruction of society is almost certainly not one."

The Controversy Over Nuclear Power

By Leslie W. Dunbar
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When the Atomic Energy Act of 1946 was passed, there was included in its first section this statement: "The effect of the use of atomic energy for civilian purposes upon the social, economic, and political structures of today cannot now be determined. It is a field in which unknown factors are involved." These sentences, though eliminated in the revised Act of 1954, are but little less valid today.

Even the most discussed use, the production of electrical power, is still encased in uncertainties. No precise estimates of power costs are agreed upon and probably are not yet possible. No settled opinion has been reached as to which are the most efficient of the great many possible reactor types. Controversy has increased regarding the proper roles of government and private business in power development. Above all, there is the unread vision of thermonuclear power, which, if it can be economically derived from deuterium fusion, will render nuclear power reactors as obsolete as coal or oil furnaces.

In the continuous presence of these and other unknowns, the Atomic Energy Commission, Congress, utility companies both publicly and privately owned, and manufacturers of reactors and equipment are contriving policies and programs for realizing the opportunities provided by the energy from fission. The first major result has been the Shippingport reactor, which since December 18, 1957, has sent its stream of current into the Pittsburgh area. Shippingport represents one form of the so-called "partnership" policy chosen by the Commission as its road to economic nuclear power. It is a policy which tailors federal participation in each project to the least required dimensions, with the goal of federal withdrawal as far as and as soon as possible. The policy seems to obey the statutory dictate to "strengthen free competition in private enterprise," as well as the other statutory obligation, "subject at all times to the paramount objective of assuring the common defense and security."

The A.E.C. has not, however, found the general approbation which it no doubt would like; criticisms in and out of Congress have been severe, and have been chiefly directed at the present conception of the right degree of governmental involvement.

In the Act of 1954, Congress restrained with a rather severe bridle its several declarations of intent to encourage the utilization of nuclear energy for commercial power:

Sec. 169, No Subsidy.—No funds of the Com-

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> mission shall be employed in the construction or operation of facilities licensed under section 103 or 104 except under contract or other arrangement entered into pursuant to section 31.

To translate, cash subsidies are forbidden. On the other hand, the Commission may make payments (Sec. 31) for the results of research and development growing out of reactor construction and operation. It may also distribute special nuclear materials—the all-important fuels such as natural or enriched uranium—at nominal or even no charge (retaining, however, ownership; Sec. 53); it is empowered to give without charge *scientific and technical information* accumulated during the years of its own military production and research.

Power Program

With these incentives, the Commission has sought to get reactors built. An absolute governmental monopoly of nuclear energy production is being relaxed, but in a controlled process. Controlled, but hardly planned. For planning would imply the exercise of far more initiative than the Commission has been willing to supply. So in its negotiations with utilities, it has left them free to propose the size, type and location of reactors. The power program can best be described not as governmentally planned, but as governmentally sponsored. It will be useful to summarize the results to date.

1. Two reactors have been completed and are marketing power. One of these is a small (5000 kw.) prototype built by General Electric at Vallecitos (California) with private financing. This plant, added to the much more important Shippingport reactor of 60,000 kw., means that today a total of 65,000 kw. of power are being generated. Two notations about this are immediately pertinent: first, there are no prospects of additional stations before 1960; second, the most exciting recent news for nuclear engineers has been the now fairly well confirmed evidence that reactors may confidently be expected to produce well above their estimated levels. In anticipation of this, Shippingport installed turbogenerators built for 100,000 kw. output.

2. Shippingport is federally owned. Built by Westinghouse under a cost reimbursement contract, it is operated by the Duquesne Light Company which furnished the site, contributed $5,000,000 to research and development expenditures, pays for the labor costs of operation, and is buying the steam produced from the reactor at a fixed rate. Power costs at this first major power reactor are estimated at approximately 65 mills/kw.

3. What A.E.C. has done with an investor owned utility (Duquesne) it is now authorized by Congress to do for four publicly owned concerns.[1] Proposals had been submitted to A.E.C. for small reactors to be built at Anchorage (Alaska), Elk River (Minnesota), Hersey (Michigan) and Piqua (Ohio); the combined output of the four, each of which is of a different type, would be 48,000-50,000 kw. The first three were proposed by Rural Electrification Administration cooperatives, the fourth by a municipality. Negotiations promised failure, and Congress has attempted to save them, through a Shippingport-like formula, i.e., separate and direct contracts for construction and for operation, for which $129,915,000 was authorized.

If the projects go through (which is still doubtful) the Commission will sell the steam produced to the operators at a rate based upon the cost of steam from conventionally fired plants. After ten years of operation, the cooperatives and the municipalities may buy the reactors on what would seem to be a highly favorable price formula; if purchase is not opted, the facilities are to be dismantled.

4. There are four reactors now actually under construction. A group of New England utilities, acting through the Yankee Atomic Electric Co., is building at Rowe (Massachusetts) one designed for 134,000 kw. Another combine, in which Detroit-Edison is the chief participant, is building at Laguna Beach (Michigan) a 100,000 kw. fast-breeder reactor. The economics of a fast-breeder, which produces more fissionable material than it consumes, depends heavily upon the government's price for plutonium.

[1] P.L. 85-162 (85th Cong. 1st session).

All reactors produce both plutonium and heat. The great installations at Hanford and Savannah River are designed for optimum plutonium output, and their heat is wasted. Great Britain's Calder Hall is primarily a plutonium producing reactor, but its heat is conserved and used for electrical generation; it is, thus, what is called a dual purpose reactor.

Prevailing American engineering opinion has tended to reject this concept, if heat is the product primarily wanted. The government is obligated under its arrangements with all power reactor developers to purchase whatever plutonium is produced, and until 1963 may guarantee the price.[2] Presently, the price is set at $30-45/gram, though A.E.C. officials have repeatedly predicted that after 1963 the price will fall perhaps as low as $12.

The Detroit-Edison reactor, unlike Calder Hall, is designed to optimize heat production; through breeding, it nevertheless produces so much plutonium that that is a basic factor in its economic value. The concept itself is widely controversial among engineers, and the project has been further complicated by serious questions of safety, insistently agitated by the United Automobile Workers as well as by scientists, and not yet finally and officially resolved.

The official estimate of A.E.C.'s assistance to Yankee is $7,980,000; to the Detroit-Edison group, $8,152,600.

5. The largest reactors now under construction are being built without direct aid from the government, although the price charged to their owners for fuel (which is, as well as the price paid for plutonium, wholly within A.E.C.'s legal discretion) is, of course, a major factor in their economics. At Dresden (Illinois) a 180,000 kw. plant is being built for Commonwealth-Edison, of which the small Vallecitos plant now operating is the prototype. In Westchester County (New York), Consolidated-Edison is building one that will have an estimated 163,000 kw. power.

6. In April, 1955, A.E.C. had predicted 2,000,000 kw. by 1960, and 3,750,000 to 6,000,000 by 1965.[3] The prediction will be clearly wrong for 1960, and no one seriously believes that another five years will vindicate the prophecy. Widespread Congressional discontent with this pace has been exacerbated by the higher and apparently sound estimates coming across the Atlantic from Britain, as well as by the hopeful estimates of Euratom. Congressional dissatisfaction with our prospects grows, fed also from the continual regurgitation of the imprudent Dixon-Yates contract.

"Partnership" Principle

7. The sponsorship of atomic power ranges from programs of governmental ownership, through programs of shared costs and private ownership, to programs of complete private financing. The "partnership" principle is represented in all, because there is no project in which at least some of such primary factors as location, type of reactor, size and selection of the reactor manufacturer have not been at the initiative of the non-federal "partner." Indeed, even such a basic factor as the choice of operators has been unplanned. The following exchange in a Congressional hearing illustrated well the Commission's method:

> *Sen. Anderson.* What particular experience does Piqua, Ohio, have that would make you select it over Peoria or Kankakee or some other place?
> *Mr. Davis* [A.L.C.'s Director of Reactor Development]. The selection in this case was that they made a proposal.
> *Sen. Anderson.* It was the fact that they walked up to the altar and said, "Here I am, a ready bride."
> *Mr. Davis.* Quite true, but we made quite sure that we wanted to marry them, too.
> *Sen. Anderson.* What attraction did the bride have? . . . We don't want to get this bride right up to the altar and not be able to marry the man to her.—
> *Sen. Gore.* Has she brought her dowry yet?—
> *Sen. Anderson.* What is this bride going to put into the wedding pact?
> *Mr. Davis.* We hope they will put their abilities into managing such a project as this.—
> *Sen. Gore.* Maybe she can't cook.
> *Mr. Davis.* We have to somehow teach them how to cook.[4]

[2] Atomic Energy Act of 1954 (Sec. 56). The obligation, of course, does not extend to Duquesne, which does not own Shippingport, nor would it to the coops and the City of Piqua.
[3] See *House Report 978* (85th Cong., 1st session) p. 28.
[4] "Authorizing Legislation." *Hearings before the J.C.A.E.* (85th Cong., 1st sess.) April and June, 1957, pp. 161-162.

Not only Piqua; all the other brides, big and small, need to be taught to cook. There are no experienced operators of reactors except the Commission's military contractors; and these, companies such as General Electric and duPont, are not in, and are not interested in getting into, the power generation business.

Incentives and Goals

American programs have not been geared, as British and Euratom plans have been, to any kilowatt goal, nor have informed persons urged either a race with our European friends, or as rapid as possible introduction of nuclear power into our transmission systems. The harsh economic incentives which impel Britain and western Europe are not intense here, where power costs are relatively low and fossil fuels relatively plentiful. Moreover, estimates of nuclear power costs hover still around 10 mills/kwh. at the best for the next ten or so years; the national average cost for coal-fired plants is under 3 mills. Even the non-engineer, however, who has studied the multitude of cost estimates disseminated in recent years, is able to detect the sound of truth in Admiral Rickover's comment:

> I think the people who are talking about the economics of atomic power today are just conducting arithmetical exercises.—No one knows with any certainty how much it costs to operate these plants. I do not know how in the world you are going to find this out until you actually operate them.—I think it is very futile to argue economics at this stage of the game.[5]

The United States in its good fortune has these years, which Europe does not, for studied development and perfection of the technology of a new industry, before the industry is actually required. The decision which the British have made—to concentrate on the Calder Hall type reactor and to push ahead fast on that choice—is of the sort which we may luxuriously avoid.

This general policy is intended to support three objectives: to prepare the United States for the time when nuclear power is needed, in terms both of costs and resource conservation; to enable American industry to compete in the export market; and to enable the United States to add to its other aid to underdeveloped countries.

The general policy is not seriously disputed. The stormy waters surrounding A.E.C. have been roiled by discontent over the means it has employed, and the short-run targets it has given itself. Criticisms of the short-run targets have been directed most importantly along three general lines: first, that the achievements have simply not been sizeable enough viewed even as an experimental program; second, that certain reactor types are not receiving attention. Thus the Commission's long time dissenting member, Thomas Murray, recommended in June, 1956, "as a matter of urgency," the construction of large scale reactors of five types; four of those have not been started.[6] Three of the five large reactors completed or in process today are of a single basic type, pressurized water. To these complaints, the A.E.C. replies that much developmental work is being done in its own and other laboratories without constructing full-scale prototypes; and that,

> It is necessary to make the best possible choices —and to push these choices as rapidly and effectively as feasible. It would be very easy to diversify the U.S. effort to an extent that all available resources would be insufficient for a satisfactory program.—As painful as progress may appear to be—, it cannot be greatly accelerated.[7]

Finally, there is a third major criticism, that maintains that natural uranium reactors (such as Calder Hall) will for economic and political reasons be of most appeal to other countries, and that by failing to develop this type more intensively we will forfeit foreign markets, and will not make our foreign aid programs attractive.[8]

Criticisms as to means have raised the question of governmental participation, and inevitably, though not very intelligently, the issue of public versus private power. The National Coal Association would confine

[5] "Authorizing Legislation" pp. 387-88.
[6] "Civilian Atomic Power Acceleration Program." *Hearing before the J.C.A.E.* (84th Cong., 2nd sess.) June 28, 1956, p. 45.
[7] Davis, et al., "The Government View." *Nucleonics*, Sept. 1957, p. 92.
[8] For a recent discussion see "The World Weighs Nuclear Alternatives," *Nucleonics*, June 1957.

governmental aid to not more than one reactor of any one type.[9] Few others, however, have expressed the belief that too much governmental aid is being given, probably because the active issue has been the opposite.

Thus former Commissioner Smythe has rebuked the Commission for its reluctance to move independently of private industry, which observes a caution in investment and design not suitable to prototype development.[10] Former Commissioner Murray's opinion has been the same: "The far-ranging possibilities of industrial nuclear power cannot be effectively exploited under continuance of this policy of reliance solely on private capital and initiative.—A new policy is needed—guided by pragmatic norms and not by doctrinaire theories."[11] And Mr. Walter Reuther has added:

> The utility companies are not powerfully motivated to develop new sources of low-cost power. The policies of state regulatory commissions assure them a fair return on their investment whether they expand or not . . . . The incentive to them is rather to occupy the nuclear power field in order to hold it against the nonprofit public power system.[12]

Action in Congress

Concurrence in this mode of thought led the majority of the Joint Committee on Atomic Energy in 1956 to report out the Gore Bill. This measure would have directed the Commission to undertake a $400 million program for the construction of large-scale demonstration reactors at its own production sites, using the electricity produced for the operation of its own facilities. The bill was passed by the Senate, in a rare display of party discipline, by a vote of 49 to 40, every Democrat joined by 3 Republicans voting for passage. In the House, the defection of 19 Democrats from coal districts caused its defeat, 191 to 203.

The Joint Committee, led by its Democratic majority, adopted in 1957 a different tactic. Instead of separate legislation, a reactor construction program was incorporated into A.E.C.'s appropriation; different also was the fact that reactor types were specifically indicated. The Committee's program again was opposed in the House; but though drastically cut, it was not rejected completely by this Congress. The Commission was voted $5,000,000—which it did not want—to start work at Hanford on a plutonium recycle reactor; it was voted $3,000,000,[13] also not wanted, for development and design work on a dual purpose reactor; and another $3,000,000, most unwanted of all, for development and design work on a Calder Hall type (natural uranium) reactor.

These legislative actions of 1956 and 1957 present real and sore problems. Our governmental processes have come to depend on executive initiative and legislative review. Here Congress, impatient and dissatisfied, has claimed the intiative, and has forced on the Executive programs which it considers unwise and unnecessary. The actions mark also a further deterioration of the once close relationship between the Commission and the Joint Committee.

Chairman Strauss had sought to forestall such action by including in the public announcement of the Commission's third invitation for reactor proposals (Jan. 7, 1957) this paragraph:

> If industry does not submit acceptable proposals for reactor plants of the types considered ready for full-scale construction, the Commission will request additional funds to initiate such projects under complete Federal financing.

It was not enough, especially as the Commission has shown no disposition to make good its threat.[14]

It is risky in the extreme for the non-engineer to form a judgment as to the adequacy of progress in nuclear power, and to take a side in the disagreement between Commission and Joint Committee. The "Three Wise Men" who prepared the *Target for Euratom* concluded, after wide study,

[9] "Authorizing Legislation," p. 592.
[10] Henry Smythe, "Nuclear Power and Foreign Policy." *Foreign Affairs*, Oct. 1956.
[11] "Report of Thomas E. Murray to the J.C.A.E. on Completion of Seven Years as a Member of the A.E.C." (mimeographed, June 27, 1957) pp. 23-4.
[12] "Development, Growth, and State of the Atomic Energy Industry." *Hearings before the J.C.A.E.* (84th Cong., 2nd sess.) Feb. 1956., p. 572.
[13] Authorized; $2,000,000 appropriated. But in regard to the appropriation of 1957, see the report in *Nucleonics*, Jan. 1958, p. 17, "Budget Bureau Holdback of Funds Hurt Atomic Program."
[14] The Commission is apparently holding to the same ground, and meeting the same opposition, in Committee hearings this year.—see *N.Y. Times*, Feb. 16, 1958, p. 37.

that "an impressive amount of research and development done both through the A.E.C. and by private industry have provided America with the most complete nuclear foundation in the world." [15]

Much of the issue between Commission and Joint Committee rests here; for such an attainment has been all that the Commission has principally sought, whereas the Joint Committee has wanted this, and more. It is perhaps a sociological note worth recording, that this Republican administration has shown an almost complete lack of a competitive desire for matching the production goals of European countries. Sometimes explicitly, but always implicitly, A.E.C. has pursued the limited goal of technological development.

The majority of the Joint Committee, on the other hand, has manifested a restless incredulity of technological progress unrevealed by production statistics. But as long as the present administration is in office, we are likely to live with the paradoxical situation where hurry-up America patiently perfects a craft, while old England throws its efforts, not toward perfection, but toward quick and large production. Given their economic and political positions, there is wisdom in what each is doing.

In one Congressional hearing, a utility executive spoke of private industry as the "chosen instrument" for the development of nuclear energy. We have a Republican administration, and one must assume that in twice electing it the voters approved its attitude toward private enterprise. Unless there was throughout the electorate a deep feeling of urgent necessity, which there obviously is not, this administration would be acting out of character, and perhaps disloyally to the people who chose it, if it did not continue its dependence on private industry. The Commission is statutorily a somewhat independent agency, yet no one has ever doubted Mr. Strauss' loyalty to the President, nor indeed that of his predecessors to the administrations which appointed them. Yet there is nonetheless need for viewpoints detached from the wills of rival interests and parties.

The inquiry can begin with what we have now, which is a mammoth nuclear energy industry owned by the government, paid for by taxation, and which, although military in purpose, is the immediate parent of nearly all that is known of the art of nuclear fission for any purpose. A non-military industry will arise in this country and will use this base of research and development; it will use the nuclear fuels produced after enormous capital investment; it will, in fact, be possible only because taxpayers have since 1942 paid $20 billion.

Thousands of scientists, engineers and workmen have been trained in new processes and are now a pool of talents for the nourishment of industry. Wholly new metallurgical concepts, as well as the processes for the manufacture of strange new equipment, have been learned at the expense of the government.[16] All of this constitutes a tremendous subsidy in fact, if not in law, of which someone will be beneficiary. The most meaningful question would seem to be, by what channels could these benefits be most fully returned to the taxpayers who financed them?

The Alternatives

Is it fair to the taxpayers, and expedient for the economy, to have nuclear power developed and marketed through privately owned utilities? [17] What is the alternative? One of the conditions which has been the traditional motivation for public power is clearly not present, and the other is in doubt. Public power has in the past seemed an expedient in two sorts of situations.

One, for the development of the hydroelectric potential of great rivers, especially if linked to other ends such as conservation or navigation. The rationale for public power in this context is altogether inapplicable to nuclear energy. Two, for the generation and/or marketing of power in municipalities or in rural areas. Typically, though cer-

[15] *N. Y. Times*, May 8, 1957.

[16] See a provocative and illuminating speech by Admiral Rickover, reprinted in "Development, Growth, and State of the Atomic Energy Industry," *Hearings before the J.C.A.E.* (85th Cong., 1st sess.), Feb. and Mar., 1957, pp. 666-70.

[17] For an emphatic negative see Adams, "Atomic Energy: The Congressional Abandonment of Competition." *Columbia Law Review*, Feb., 1955; and, in the same journal for Feb., 1956, a rejoinder: Palfrey, "Atomic Energy: A New Experiment in Government-Industry Relations."

tainly not exclusively, such ventures have not been large-scale. There is a growing conviction that nuclear reactors are economically suitable only for large generating plants.[18]

Even if this is not so, or even if publicly owned utilities can use large reactors, it does not follow that the nation's taxpayers are benefitted through public power developments in the comparatively few municipalities which have public power, or in the coop areas. Especially as to REA, there is no self-evident justice in still another federal boon being granted to the farmers.

Nuclear power under public auspices makes sense in this debate about justice only if it is proposed that it be produced by the federal government, for national objectives; or unless a far greater number of localities, and bigger ones, than is now the case, choose to assert public ownership. Neither of these solutions seem in prospect, or wanted by effective public opinion. At present, the A.E.C. is also prohibited by statute from selling power, unless excess power is produced incident to its own operations.[19]

Increased governmental investment in development and prototype construction, as contemplated by the Gore bill or provided by the 1957 appropriation, will only increase the public legacy that utility firms, whether privately, publicly or cooperatively owned, will inherit. And because privately owned utilities still supply the far greater share of the country's electricity, they are likely to be the principal heirs. It is hard to see that these Congressional programs are in the interests of taxpayers or consumers, who do not care whether their electricity is derived from fission or the burning of fossil fuels or the cascading of waters, but who are interested keenly in their tax bills and their rates.

Nuclear power technology needs to be skillfully and thoroughly developed, both in the interests of realizing to the full its potential for cheaper electricity (especially for such high power cost areas as New England), and of conserving our supplies of fossil fuels. But reason would seem to suggest the mandate to carry through this development should be a general one within which the judgment of technicians should be decisive as to means.

This does not of course suggest that the Commission's judgment is infallible, or even necessarily the best. The Commission has, however, the statutory responsibility; and for Congress to add to its own proper role of review and criticism the job of directing the Commission into specific projects is, at the least, to breed a program which is the clear and assignable responsibility of no one. These Congressional moves presented no intelligible issue of public vs. private power: they involved little more than the level of governmental participation in a developmental program the immediate beneficiary of which is likely under any circumstance to be private industry.

Nor does the problem of monopoly seem pertinent. Nuclear energy has many uses, but the reconstruction of society is almost certainly not one. It is a means of producing steam for the generation of electrical power: Congressional deliberation would be improved if confined to those strictly economic terms. There will be problems enough, without magnifying and distorting issues. One problem, for example, which has hardly been discussed, almost certainly lies only a short way ahead; that is the problem of the absorption of the high cost for reactor construction into the cost structures on which rates are based and approved by the state regulatory bodies.

The argument of the preceding paragraphs is subject to one important, and potentially overriding, modification. To whatever extent foreign policy may require a more fully developed nuclear power industry here, governmental responsibility is direct and goals rather than domestic means become important. The picture is far from clear.

The countries which most urgently require new power sources (Great Britain, western Europe, Japan) are able to build their own reactor plants. The United States stands now ready to sell them enriched uranium, and also heavy water. They may choose to buy or they may prefer the greater independence of natural uranium. If they follow the latter course, it is at least doubtful

[18] See, e.g., *Nucleonics*, Jan. 1958, p. 48.

[19] Atomic Energy Act of 1954, sec. 44; the provision contains a preferential clause for publicly and cooperatively owned utilities.

whether American development of natural uranium reactors will, for very long, make them our customers; it is much more probable that they will want to construct their own.

Among the underdeveloped countries, which are not now in a position to build and operate reactors, some have no urgent requirement anyhow at this stage in their economic development; others, such as India, may indeed prefer natural uranium. An off-setting factor may be, however, their greater interest in enriched uranium if fuel can be channeled to them through the International Atomic Energy Agency.

If the Commission is to be criticized, this writer would think that fault finding would be more valid in fields other than its progress toward economic nuclear power. Indeed, its old weaknesses—inability to express policies clearly, a more than usual lack of candor, and an irrepressible inclination to boast—have probably aggravated more than a little the controversy over its power policies.

The Commission is an agency *sui generis*. Here is an organization created without a pattern, administering its awesome duties by techniques not before tried, and executing economic policies for which no label has been yet contrived. It has five large functions, any one of which might be enough to exhaust the energies of the Commissioners who lead it. These are the production (including mining) of weapon materials and weapons; research in nuclear physics; the representation of the United States in international negotiations dealing with nuclear energy; the sponsorship of non-military uses, thus requiring the Commission literally to bring into existence a new industry; and, finally, the regulation of the industry which results.

This is an enormous and diversified assignment. Someday it will have to be reconsidered, perhaps along the line of separating the manufacturing functions from all others. That day may not be far off, for the relationships of government to a nuclear power industry out of its swaddling clothes will have to be far different from those now in effect. At this time, however, our best reliance for purposeful leadership in nuclear power is on the Commission, and though that leadership ought to be criticized, to destroy it leads along the path to irresponsibility in government.

". . . Atomic power holds promise of becoming profitable because it alone can make available an extensive new source of energy to fuel-short, energy-hungry nations. Less obvious but equally significant is the consideration that, if fissionable materials in substantial amounts are diverted to the production of civilian atomic power under an arms control agreement the world can create a device—backed up by a real profit motive—which will lessen military potentials throughout the world, but it will convert one of its extremely costly components—fissionable materials—from a sterile status into one of financial gain and economic benefit.

"There is another important adjunct to our activity which is vital to both product lines. We must secure the adoption of uniform international rules for health and safety, in order to remove this controversial subject from the arena of national political bias and propaganda. When mankind intrudes on nature's balance of matter, dangerous sources of radiation result, the malignancy of which cannot be extinguished or shortened. We must move into the Atomic Age with caution, lest we open a Pandora's box to plague our children. . . ."

Robert McKinney, U. S. Representative to the International Atomic Energy Agency, Atomic Policy in the Space Age, March 18, 1958.

The story of power development on the St. Lawrence River begins early in this century and reflects differences between Canada and the United States, between the United States federal government and New York State and between public and private power interests. Now, according to this author, "the North American peoples are soon to enjoy the benefits of cheap, abundant hydro-electric energy and improved navigation."

Power Along the St. Lawrence

By William R. Willoughby
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From the standpoint of power development potentialities, few North American rivers equal the St. Lawrence. By a series of rapids it drops 225 feet between Ogdensburg and Montreal and discharges each second some 237,000 cubic feet of water into the Gulf of the St. Lawrence. Owing to the immense natural storage of the Great Lakes and the permeable soil of the surrounding region, the river's flow is so uniform and its daily fluctuations so slight as to provide almost ideal conditions for the operation of generating plants. No less important, it traverses a region rich in natural resources—except for a dearth of coal in Ontario—and potentially capable of tremendous industrial development.

As early as the first half of the seventeenth century French colonists utilized the St. Lawrence's fast-flowing waters to operate grist mills and sawmills. A century and a half later the settlers of northern New York made similar use of the waters on their side of the river. With the invention late in the nineteenth century of the water-driven turbine, and the development of long-distance transmission, the river's potentialities were tremendously increased, and numerous enterprising companies began a competitive race to procure power development privileges. One of the most successful was the Aluminum Company of America, which in 1902-1906 acquired numerous properties and concessions on both sides of the river in the so-called International Rapids section, between Ogdensburg and Cornwall.

In 1907, Alcoa obtained from a complaisant New York legislature the right to build a dam across the Long Sault Rapids, from the American shore to Barnhart Island, in the center of the river, and to use the entire flow south of the boundary for power development purposes. But because of strong Canadian objections and the refusal of Congress to give its approval, construction was not started, and in 1913 a less complaisant legislature repealed the concession.

With the entry of the United States into the First World War, and the development of an acute power shortage, American and Canadian governmental authorities were again bombarded with petitions from concession-seeking companies. Except for a concession of limited importance granted Alcoa, all petitions were rejected.

But the officials at Ottawa were greatly disturbed. Not only was it embarrassing to be constantly subjected to pressure from con-

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cession-seekers, there was a very real danger that privileges would be granted that would seriously impede the utilization of the river for both navigation and power. Furthermore, to permit "a haphazard series of unrelated private enterprises" was not utilizing to the best advantage the power potentialities of the river.

Consequently, in September, 1918, the Canadian Government suggested that the two federal governments assume the responsibility for formulating and sponsoring a plan for the most economical and comprehensive development of the power of the International Rapids section in the interests of both countries.

Probably because they were preoccupied with the immediate problems of war production, the American authorities made no official reply to the Canadian offer. But the proposals were not forgotten. Immediately after the termination of hostilities the question of the more adequate utilization of the waters of the St. Lawrence was again brought prominently to the fore. Now, however, the emphasis was on navigational improvements.

Navigational Improvements

Starting in 1700, the Canadian people had carried forward an almost uninterrupted program of dredging and canal construction along the St. Lawrence until by 1903 they had obtained 14-foot navigation from Lake Erie to Montreal, 20 from Montreal to Quebec, and 30 from Quebec to the Atlantic. Beginning in 1823, the Americans had improved the navigation of the Great Lakes until by 1914 they had provided 21 foot channels for upbound traffic and 25 for downbound from Duluth, on Lake Superior, to Buffalo, on the eastern end of Lake Erie. But, because of the rapid growth in the size of vessels, by 1919 both the Canadian and the American improvements were hopelessly outmoded.

By 1919, rail freight rates had greatly increased also, while the price of farm and factory products had remained stationary or had declined. Worse still, the railways did not have the facilities to move the wheat and manufactured goods now pouring out of the lakes region. On both sides of the boundary an insistent agitation arose for a jointly-developed improved St. Lawrence waterway. To provide unity for the pro-Seaway groups, a Great Lakes-St. Lawrence Tidewater Association was created in the United States, and a Deep Waterways and Power Association was organized in Canada.

American Canadian Joint Board

In response to these coercive forces, in March, 1919, Congress passed, and the President approved, a bill asking the International Joint Commission (created in 1911 to deal with Canadian-American boundary water problems) to conduct an investigation and make recommendations with respect to the cooperative improvement of the St. Lawrence between Montreal and Lake Ontario in the interest of navigation. After a delay of several months, the Canadian Government accepted the American offer and the I.J.C. was set to work conducting public hearings and studying the economic and political aspects of the proposal, while a joint engineering board was given the task of studying and reporting on the technical aspects.

The conclusions of the joint board were that physical conditions on the St. Lawrence were extremely favorable for improvements of navigation; that improvements could best be secured through the combined development for navigation and power of the International Rapids section through the construction of dams to flood out the rapids, by the construction of side canals around the rapids of the Canadian section of the river, and by the excavation of the connecting channels of the Great Lakes. The I.J.C. accepted the board's conclusions and went on to recommend that the United States and Canada enter into a treaty arrangement for the improvement of the river.

Although the conclusions of the board and the I.J.C. were greeted with satisfaction by most Americans and by many Canadians, for months Prime Minister Mackenzie King found various reasons for delaying the opening of negotiations. First questioned was the desirability of enabling an enlarged board to carry out additional studies with respect to engineering plans. Next he delayed to give an advisory committee time in which to "inquire fully from a national standpoint

into the wide questions involved. . . ." Then there was the necessity for the Dominion Government to consult Ontario and Quebec on questions of Dominion-Provincial jurisdiction over power rights. Later still came the advisability of keeping the St. Lawrence issue out of the forthcoming general election.

Canadian Reluctance

The truth of the matter was that there were still other reasons for the reluctance of the King Government to sign a treaty covering the cooperative improvement of the St. Lawrence. One was the opposition of organized groups—particularly the utility and shipping interests of Montreal. A second was the reluctance of many Canadians to enter into an intimate partnership arrangement with the powerful, somewhat unpredictable American Republic. A third was a widespread belief that Canada already had ample supplies of electric energy and adequate transportation facilities. And a fourth was King's fear of antagonizing the French Canadian members of Parliament—virtually all opposed to the project—upon whose support he was dependent for his tenure in office.

With the coming of the Conservatives to power in July, 1930, the prospects for a St. Lawrence treaty appreciably brightened. But Bennett, the Conservative leader, also found numerous reasons for delaying the opening of treaty negotiations. Thus it was not until the summer of 1931 that negotiations began, and it was many months after that before the representatives of the two governments were ready to sign a treaty.

Private Versus Public Power

The long delay afforded the utility companies another opportunity to press for power development concessions. At the urging of a Republican Governor, Nathan L. Miller, in 1921 the New York legislature had created a State Water Power Commission with authority to issue development licenses to private companies. Under the authorization of this law, three companies, the Louisville Power Corporation, the St. Lawrence Transmission Company (later the St. Lawrence Valley Power Corporation), and the American Super-Power Corporation of Buffalo, applied for concessions in the International Rapids section.[1] But largely because of a disagreement as to the relative status of the rights of New York and the Federal Government with reference to boundary streams, no action had been taken on the applications at the time of Alfred E. Smith's inauguration as Governor of New York, in January, 1923.

One of Smith's first moves was to urge the legislature to abolish the Water Power Commission and to authorize development and transmission of the St. Lawrence and Niagara water resources by the state itself. The Republican-dominated legislature ignored his recommendations, but the Commission, now under Democratic control, decided that "pending the establishment of a fixed and definite policy of water development in the state" it would not act on the pending applications.

In 1925, after the governor's office and the Water Power Commission had again come under Republican control, the private companies were allowed to present new applications. After extensive public hearings, late in 1926 the New York agency indicated that it would soon issue a license either to the St. Lawrence Valley Power Corporation or to the American Super-Power Corporation. But the commissioners had underestimated the persistence and political acumen of Alfred E. Smith. Fresh from another victorious gubernatorial campaign, the Democratic leader demanded that the legislature be given another chance to consider the advantages of state development of the St. Lawrence waters. When the commissioners showed no inclination to accede to his demand, the Governor-elect warned that he would resort to legal action. That was too much for the companies. Each, in turn, announced that, since the risks were greater than the likely benefits, it was withdrawing its application.

Although he had prevented the St. Lawrence power sites from falling into the

[1] The Louisville Power Corporation and the St. Lawrence Transmission Company were owned by the Frontier Corporation, which, in turn, was owned and controlled by Alcoa, the General Electric Company, and the E. I. Dupont de Nemours Company; while the American Super-Power Corporation was largely owned by the Duponts and the Mellons.

hands of the private companies, Smith was not able to persuade the legislature to accept his power development proposals. His Democratic successor, Franklin D. Roosevelt, was more successful. Through the skillful use of cajolery and pressure politics, in January, 1931, he persuaded the Republican-controlled legislature to create the Power Authority of the State of New York, with authority: (1) to obtain from the federal government any licenses that the state might need in developing its power resources; (2) to join the appropriate federal and Canadian officials in working out plans for the development of the power of the International Rapids section; and (3) to negotiate contracts with the utility companies for the transmission and distribution of the power.

The Hoover-Roosevelt Disagreement

The New York plan soon involved Governor Roosevelt and President Hoover in a bitter controversy. Assuming a vigorous states' rights position, Roosevelt demanded that, as a condition precedent to the conclusion of treaty negotiations with Canada, the federal authorities first negotiate with New York an accord relative to the conditions under which the American share of the St. Lawrence power was to be turned over to the state.

Hoover, standing as the champion of federal supremacy, insisted that a Canadian-American treaty would have to be signed before any decision could be reached relative to the disposal of the power, and that, in any event, whatever the rights of New York might be with respect to electricity developed as an incidental consequence of the improvement of navigation, utilization of that electricity would have to depend upon the authority and permission of the Federal Government.

The Understanding of 1932

On July 11, 1932, Canada and Ontario signed an agreement relative to the conditions under which the province was to take over the Canadian share of the power developed in the International Rapids section. Eight days later Canada and the United States signed a treaty providing for the cooperative construction of a 27-foot waterway from the head of Lake Superior to the sea and the development of some 2,200,000 horsepower of electricity—to be shared equally between the two countries—in the International Rapids section. More than six months later representatives of the War Department and the Power Authority initialed a memorandum of joint recommendations regarding the allocation of costs and the conditions under which New York was to take possession of the American share of the St. Lawrence power. Now all that was needed to get construction under way was legislative approval of the three understandings.

Legislative Disapproval

Knowing the United States Senate's reputation for scuttling treaties, the interested Canadian legislatures decided to postpone consideration of the accords of concern to them until after the Senate had taken some action. In April, 1933, the House of Representatives approved the War Department-Power Authority memorandum relative to the disposal of the power, but the Senate refused to act. In January, 1934, the Seaway treaty was submitted to the Senate by President Roosevelt with a strong recommendation that it be approved. But the anticipated approval was not forthcoming. The railroads, the shipping interests, the Eastern and Gulf ports, the champions of a deep waterway across New York, and persons interested in the Lakes-to-the-Gulf barge canal lined up solidly in opposition to the treaty. The same was true of the utility companies, the coal mining industry, and other groups fearful of the competition of cheap St. Lawrence power. By a vote of 49 to 43, the Senate, on March 14, 1934, refused to give the treaty the required two-thirds majority approval.

From the summer of 1934 onward the Roosevelt Administration made several attempts to win Canadian acceptance of modifications of the treaty to make it more palatable to the Senate, but the attempts were unsuccessful. Because of a decline in foreign trade, a slump in power consumption,

and the vigorous opposition of the premiers of both Ontario and Quebec, the Bennett Administration had lost much of its earlier interest in the St. Lawrence undertaking.

The return of the Liberals to power in 1935 gave a temporary boost to the hopes of the proponents. But it was not until the outbreak of the European war that the governmental leaders at Ottawa and at Toronto became actively interested in the dual-purpose project. The need for electricity for war production called emphatic attention to the potential power going to waste in the International Rapids section. At the same time, the shortage of coastal shipbuilding facilities called attention to the Great Lakes shipyards that were being inadequately used because of the limited size of the St. Lawrence canals.

The Understanding of 1941

A new Canadian-American understanding was signed in March, 1941, which differed from that of 1932 in two important respects: first, it dealt not only with navigation and power development along the St. Lawrence waterway, but also with the redevelopment of Niagara Falls; and, second, it was designated an "agreement," making it subject to approval by a majority vote of each of the houses of Congress.

The agreement was favorably reported by the House Committee on Rivers and Harbors, but, following the attack on Pearl Harbor, it was shunted aside by more urgent matters. In 1942 after an acute power shortage had developed on both sides of the boundary, President Roosevelt seriously considered using his wartime authority to build the power development in the International Rapids by executive action. When, however, he learned that at least three years would be required to obtain any power from the development, he abandoned all thoughts of using that procedure. In 1944, the dual-purpose project was brought forward as a plan to aid the transition from war to peace. But Congress refused to cooperate. For several years thereafter the project's history was simply a succession of hearings and reports, setbacks and defeats.

The "Power Priority Plan"

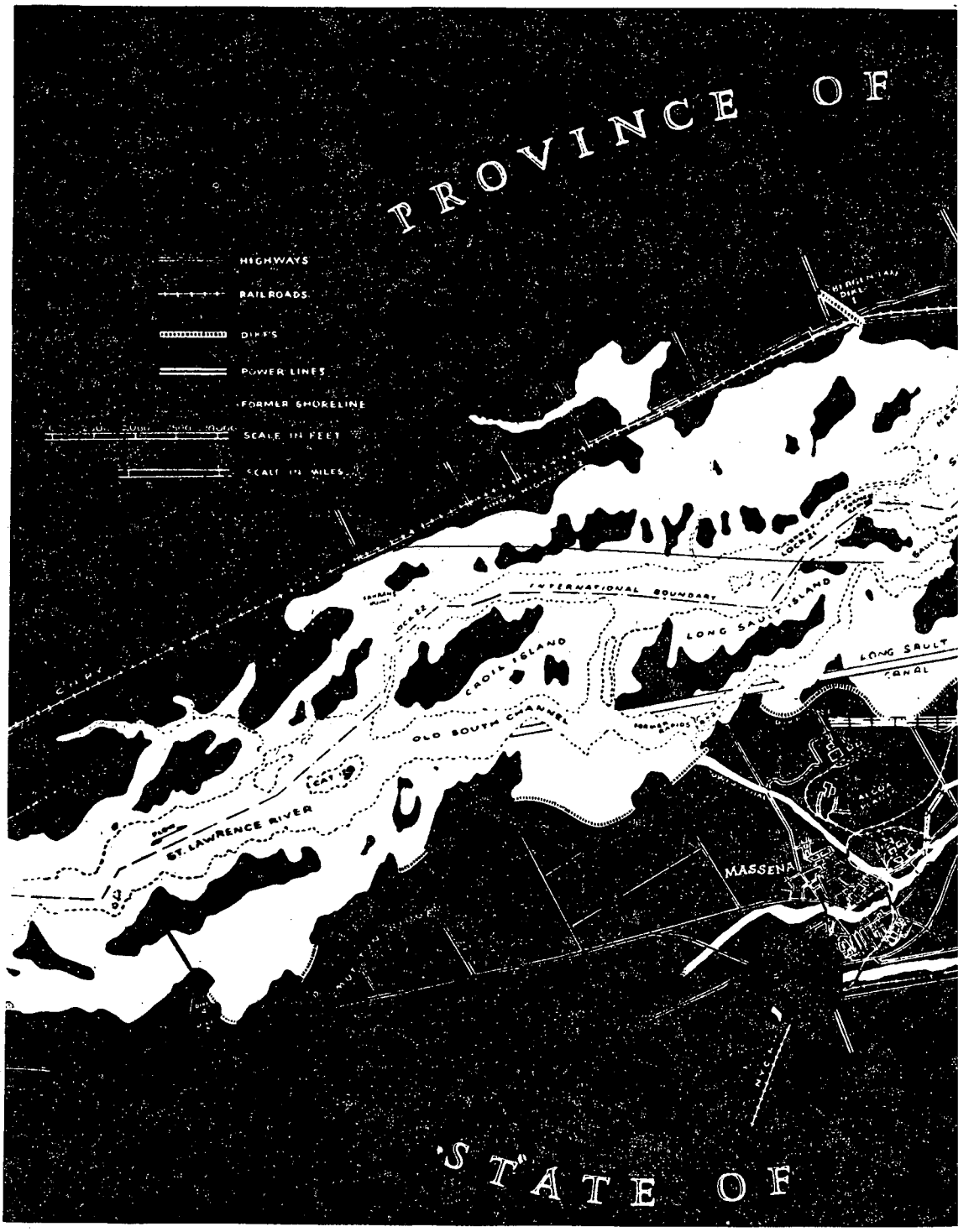
Early in 1948, officials of Ontario and New York came forward with a plan for ending the deadlock. This was the separation of the power phase from the navigation—to enable the province and the state to proceed at once with the joint development of the power of the International Rapids section, leaving the two federal governments to carry out the proposed navigation improvements when and if they were found desirable.

Implementation of the "Power Priority Plan" called for limited cooperation of governmental officials both in Washington and in Ottawa. The applications of New York and Ontario for permission to change the level of the river had to be transmitted to the International Joint Commission, and New York had to obtain a license from the Federal Power Commission. Unfortunately for the hopes of the sponsors of the plan, for a time both President Truman and key members of the Canadian Cabinet were opposed to the abandonment of the plan of construction embodied in the agreement of 1941. The President, in particular, felt that to accept the New York-Ontario plan might cause an indefinite delay in carrying out the proposed navigational improvements. Accordingly for months he refused to permit the state's application to be transmitted to the International Joint Commission.

New York also encountered difficulties in its attempts to obtain a license from the Federal Power Commission. After hearings, recesses and rehearings extending over more than two years, the commissioners in December, 1950, rejected the state's application and recommended that the Federal Government, in cooperation with Canada, proceed at once with the combined navigation and power project.

As weeks and months passed, and Congress signified no intention of approving the agreement of 1941, the authorities at Ottawa came to the conclusion that acceptance of the New York-Ontario plan offered the only hope of getting the power development under way within a reasonable time. Consequently, as a concession to the President, in September, 1951, they offered to construct the Seaway as a Canadian project if Mr. Truman,

MAP OF THE ST.



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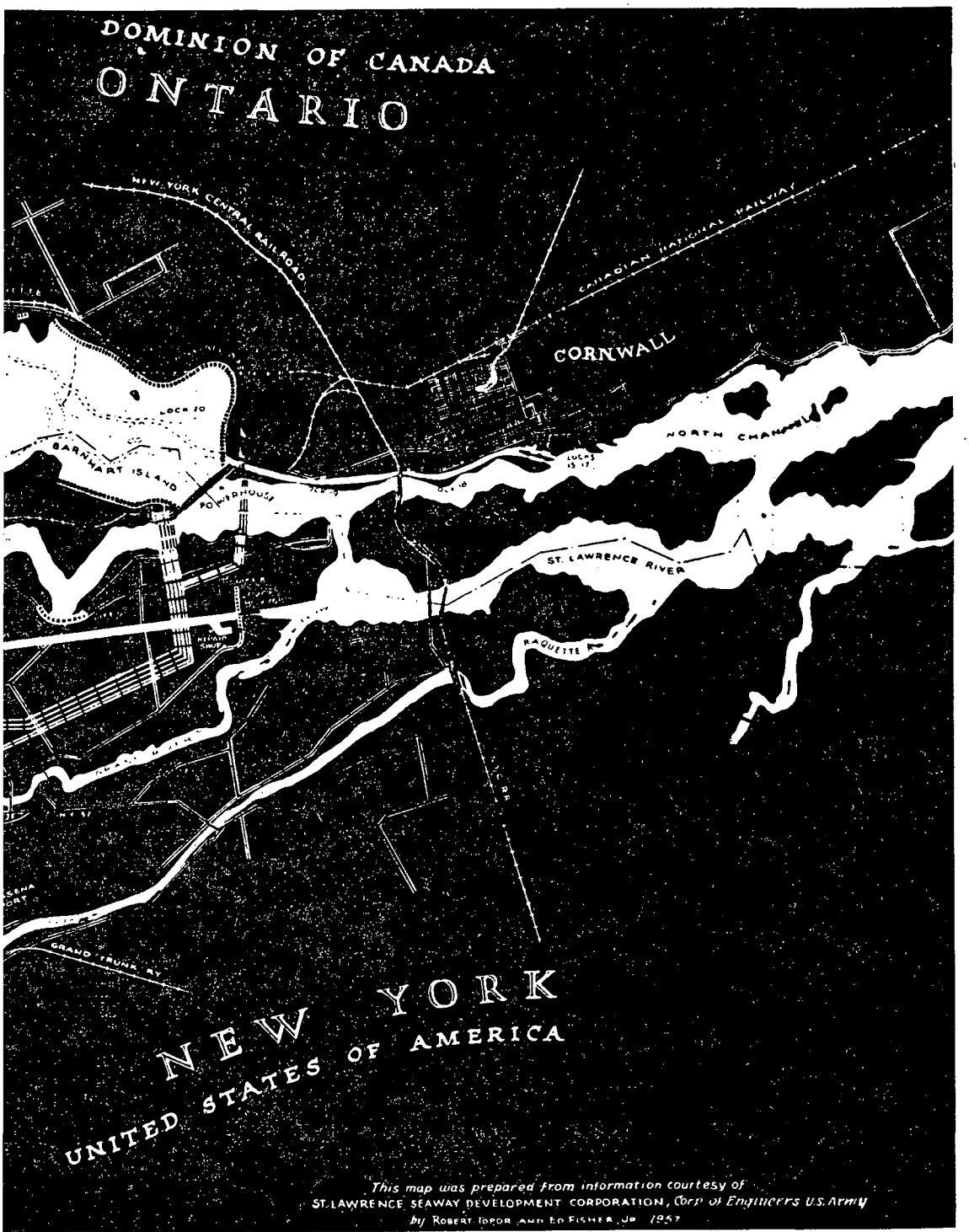


By permission of Syracuse University Press, from The New St. Lawrence Frontier *by Sidney Sufrin and Edward Palmer, 1958.*

in turn, would permit the Ontario Hydro and an American entity to develop the power. Very reluctantly, the President agreed to support Canadian action "as second best" if an early start on the development could not be obtained.

Late in June, 1952, after the Senate Foreign Relations Committee, by a vote of 43 to 40, had pigeonholed a resolution authorizing approval of the agreement of 1941, the two federal governments submitted joint applications to the International Joint Commission for the construction of power works in the International Rapids section by the Ontario Hydro and an "entity" to be designated by the United States. Three months later the Federal Power Commission agreed to reconsider New York's license application.

The I. J. C.'s permission was speedily given, but getting the Power Authority designated the cooperating "American entity" proved a different matter. Hearings before the F. P. C. started in September, 1952, but some 21 months were to elapse before its proceedings (and the court proceedings that followed) were completed and the government at Washington was finally able to designate the New York agency as the cooperating "entity."

Conclusion

This long delay was to have two significant consequences. First, it was to place still an additional strain on amicable Canadian-American relations, as well as on the patience of Canadian and New York political leaders; and, second, it was to give Congress one final opportunity of obtaining for the United States a share in a St. Lawrence deep waterway. This opportunity it took advantage of by the passage of the Wiley-Dondero Act, signed by President Eisenhower on May 13, 1954. Work on the two projects was started in the summer of 1954, and is expected to be completed in 1959. Thus, after many delays and disappointments, the North American peoples are soon to enjoy the benefits of cheap, abundant hydro-electric energy and improved navigation.

"At this stage it appears that the federal power program of New Deal-Fair Deal days has been temporarily sidetracked by an unsympathetic administration," notes this specialist, who adds: "But the High Hell's Canyon dam is far from a dead issue; its numerous friends refuse to let it expire."

The Hell's Canyon Project

By Theodore Saloutos
Professor of History, University of California

Hell's Canyon, one of the last of the great power sites in the country, is about 90 miles north of Weiser, Idaho. It is in a deep gorge of the Snake River—the largest tributary of the Columbia River—and serves as the boundary line between Oregon and Idaho. Hell's Canyon is in a remote spot and can easily create the impression that it was transplanted from another less civilized society. But its potential as a producer of power is well-known; and shortly after the Second World War, it became the subject of one of the most dramatic power struggles in recent years.

The effort to harness the power resources of the Columbia River Basin has a long and exciting history of its own. Suffice it to say that during 1947 the Department of the Interior and the United States Army Corps of Engineers prepared independent and comprehensive plans for the Columbia River Basin. Both recommended the construction of a high dam for developing the region, and both agreed to have the Bureau of Reclamation of the Department of the Interior take over the planning of it. In 1950, when the Bureau of Reclamation transmitted its report, the Omnibus River and Harbors and Flood Control bill was being considered by the Eighty-first Congress. This report, consistent with the wishes of the Army, proposed an amendment to the House bill recommending construction of a number of projects, including the high dam. Introduced by the Senate Committee on Interior and Insular Affairs, the amendment was called up for debate, but it failed to pass. Other "high dam" bills were introduced and they too failed.

Meanwhile, the private utility interests began to act. In December, 1950, the Idaho Power Company, a Maine corporation, applied to the Federal Power Commission for a license to build a dam at Oxbow, stating, among other things, that this was only one of a series of low dams contemplated in the area. This immediately brought protests from the United States Department of the Interior and others sponsoring the high dam. Subsequent proceedings before the Federal Power Commission extended over a period of four and one-half years.

New bills embodying the recommendations of the Commissioner of Reclamation and the Secretary of the Interior for a high dam were introduced during the eighty-second and eighty-third sessions of Congress, but nothing came of them.

By January, 1953, when the Republicans took over the reins of the federal government, public power under Democratic auspices had made considerable progress; in fact this was a record of accomplishment that the New Deal-Fair Deal looked to with a sense of pride. By this time the federal government had become the largest single producer and supplier of electricity in the United States; it furnished almost all the electric power in Tennessee, and was a major supplier in Alabama, Mississippi, Washington, Oregon, Montana, California, Arizona and Nevada. Most of the $9.7 billion authorized by Congress as of June 30, 1953, had been earmarked for the Tennessee

Theodore Saloutos *is the author of several articles on agricultural topics. He is the author of* They Remember America *and co-author of* Agricultural Discontent in the Middle West.

Valley Authority and the Columbia River Basin.

Construction of the first federal power and flood control project on the Columbia River began in 1933 under New Deal auspices. During the next 20 years a number of large and small projects were authorized on the Columbia and its tributaries: Bonneville, Grand Coulee, McNary, The Dalles, Chief Joseph, Hungry Horse, Lookout Point, Ice Harbor, Detroit, John Day, Lower Monumental, Dorena, Holley, Cottage Grove and Fern Ridge. The Roosevelt and Truman administrations worked relentlessly to increase federal production and distribution of power.

In 1953, the Eisenhower Administration, in line with its pre-election promises to create a climate favorable to private business, called a halt to the power policies of the New Deal-Fair Deal. Douglas McKay, the former governor of Oregon and a recognized foe of federal power, made this clear as Secretary of the Interior; and in this capacity he helped launch the so-called "partnership idea" of the Eisenhower Administration, which in itself sounded simple and decent.

Its underlying philosophy was clear. Hereafter the federal government would cooperate with non-federal agencies, including state and local governments and private power interests, in developing the power resources of the country. The private utilities viewed this action as necessary if the federal government was to be eliminated as a competitor. But Democrats and others in favor of a multi-purpose high dam on the Snake River and federal power bitterly assailed this action as the betrayal of public trust; and they branded it as the beginning of a gigantic "giveaway" program, a modernized form of piracy that promised to undo the accomplishments of the previous 20 years.

The new Secretary of the Interior, in keeping with the stated policy of the administration, withdrew the protest lodged by his predecessor with the Federal Power Commission against the Idaho Power Company. In short, the Eisenhower Administration was prepared in fact as well as theory to encourage a private project, if the benefits from it were comparable to a federal one, thus releasing federal time and money for other purposes. Now the Idaho Power Company had a sympathizer at its side instead of an antagonist.

This shift in administration policy had its reverberations in the Pacific Northwest, creating "an epidemic of disagreement . . . referred to as 'Hellpox.'" To the foes of federal power, the proposed high dam at Hell's Canyon was socialism in concrete; and to the adversaries of the private utilities, the three little dams of the Idaho Power Company became symbols of the administration's "giveaway" program. Punsters even joined the fray by suggesting that "you take the high dam, and I'll take the low dam."

Little was spared as the lines of battle were drawn. Statistics, charts, graphs, expert testimony, congressional hearings, feature articles, public speakers, in fact every conceivable device was employed to win friends and influence people. The public power advocates were indignant and entered the battle with the spirit of missionaries, convinced that they had to protect the country from a well-heeled group of profiteers operating under the protective wing of the Republican party.

For the most part politicians in Oregon, Washington and Idaho divided along party lines; the Republicans favored the Idaho Power Company and private enterprise, and the Democrats supported federal power and the Hell's Canyon dam. Their constituents followed party lines less closely. The State Federations of Labor in Washington, Oregon, Idaho and Montana endorsed the Hell's Canyon dam; and the American Federation of Labor concurred in their actions. The farm groups, however, were divided. The Oregon State Grange and the Farmers' Union supported Hell's Canyon, while the Idaho Grange and Farm Bureau fought it. Administration foes wanted the public hearings on the rival power plans drawn out until election time in the hope of electing more Democrats.

The Case For Hell's Canyon

Hell's Canyon, according to its most ardent supporters, in the beginning at least had some 300,000 extra kilowatts (900,000 vs. 633,000) of electricity to offer the people

of the Pacific Northwest. It would provide about four million acre-feet of water storage that could be released during low water stages in the Snake and Columbia Rivers; and it would integrate the water flow and enable downstream dams in existence, under construction, and authorized, to provide additional power. Furthermore, if this project were scrapped, in all likelihood the four authorized but unfinished dams—Lower Monumental, Little Goose, Lower Granite and Ice Harbor—would be abandoned, bringing the total loss of power to more than two million kilowatts.

A high Hell's Canyon dam, continued its allies, would also assure the continued industrial growth of the Pacific Northwest. Coal was unavailable, the cost of hauling it from other parts of the country was prohibitive, and timber was too expensive to use as a fuel. Expansion of the federal power program would satisfy these fuel needs and aid the defense effort in the very same fashion that it satisfied fuel needs and aided the defense effort during the last war. Cheap federal power, among other things, made possible the growth of the aluminum industry in the region.

Low cost power also promised substantial savings for the farmers on their fertilizer purchases. Of necessity the western and middle western producers were compelled to buy fertilizers in the southeastern states and pay high freight rates on them, instead of buying nearer home where the bulk of the phosphate resources of the nation were located. A low cost federal power program such as that proposed at Hell's Canyon would make it possible to exploit the phosphate resources of eastern Idaho, bring the farmers cheaper fertilizers, and saving them the costs of distant transportation.

Hell's Canyon enthusiasts were equally convinced that a high dam with a storage capacity of four million acre-feet would do a much better job of controlling floods than three little dams with a storage capacity of only one million acre-feet. They were of the opinion that a high dam would facilitate reclamation work in the vast sagebrush areas of Idaho, and reduce the costs of irrigation in Oregon.

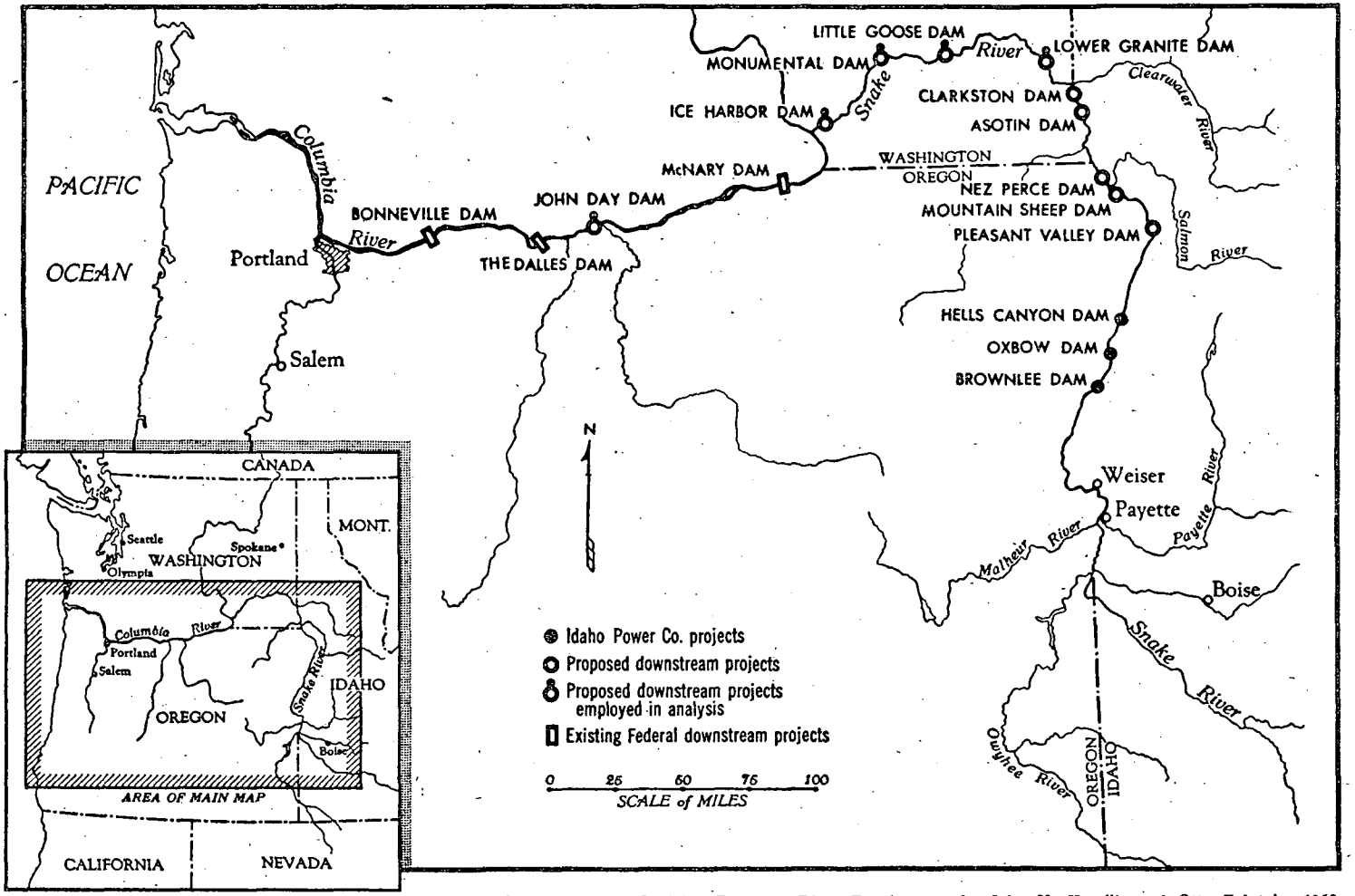
Reduced to simple terms the most important issues in the controversy, as seen through the eyes of the federal power advocates, were: (1) the maximum utilization of water power resources on the basis of integrated development and operation; and (2) the generation of an abundant supply of electricity at costs low enough to make possible a speedier development of the region. Contrasting the industrial progress of Washington and Oregon with the lack of progress in Idaho one would come to the conclusion that the availability of low cost power was the basic cause for advancement in the former two states, and the unavailability of sufficient quantities of low cost power was basically responsible for the undeveloped condition of the latter state.

The Case Against Hell's Canyon

Proponents of the three little dams of the Idaho Power Company argued with equal vigor that they had more to offer the people of the Pacific Northwest than the high Hell's Canyon dam, and usually began their case by stressing the savings and earnings they would net the taxpayers in an age of rising governmental costs. Douglas McKay, the Secretary of the Interior, bolstered their position by insisting that the issue was one of economics and not politics: "There are 1.75 billions of dollars involved in Hell's Canyon and today the Government doesn't have that kind of money to throw away." As a rule private utility spokesmen contended that the three little dams would save the citizens millions of dollars in construction costs, and bring additional millions to local, state and federal governments in the form of revenue.

These tax claims became a sore point with the sponsors of the Hell's Canyon dam who not only denied their validity, but countered with an argument of their own that several times more revenue would be collected by the various governmental units from the new industries and activities stimulated by a low-cost, long-range federal power project such as they proposed. They cited developments in the Bonneville Power areas and the Tennessee Valley Authority where low cost power brought tremendous increases in property values, income and taxes.

MAP OF HELL'S CANYON AREA



By permission of The Johns Hopkins Press, from Multiple Purpose River Development *by John V. Krutilla and Otto Eckstein, 1958.*

Before T.V.A. was built, the seven states served by it paid slightly more than three per cent of the federal income taxes, while in 1952 their payments were almost twice as large. Through the years government revenues increased by billions, and promised to increase even more in the future. A high Hell's Canyon dam, they argued, would bring comparable results; while the payments of the Idaho Power Company would appear trivial by comparison.

Private utilities spokesmen continued emphasizing the tax-saving and tax-paying features of the three little dams, and referred to the backlog of desirable public undertakings, totalling many billion dollars, that could qualify for federal financing. In view of these and the pressing defense needs of the nation, all financial avenues—federal, state, local and private—had to be tapped. The Idaho Power Company, they maintained, offered to cooperate in these endeavors by obtaining a license from the Federal Power Commission and building a series of small dams.

As a consequence Congress—which was being asked to authorize the Hell's Canyon project—was urged to abide by the decisions of the Federal Power Commission, the United States Circuit Court of Appeals and the United States Supreme Court which refused to review the license. Finally, respect was due to the views of the Federal Power Commission, a bipartisan body of five members of whom no more than three were adherents of the same political party, and which was equipped with a staff of expert engineers and attorneys to study all applications.

The arguments presented before the United States Circuit Court of Appeals by the advocates of federal and private power assumed the following course. The National Hell's Canyon Association and certain public utility districts contended in their complaint that the proposal of the Idaho Power Company to develop the water power resources of the region was hardly the best one that could have been devised to carry out the comprehensive program outlined in the Federal Power Act. The Circuit Court replied that conflicting evidence was submitted and that in such cases the Federal Power Commission was vested with broad discretionary powers; and that the commission had already concluded that either the Idaho Power Company project or the high Hell's Canyon dam could accomplish about the same results in matters of flood control, navigation and recreation. When it came to power production, the commission chose the Idaho Power Company plan for which $175 million was available.

The Hell's Canyon dam, on the other hand, promised somewhat greater benefits and involved $400 million, but its construction was never authorized by Congress. As a consequence, the United States Circuit Court of Appeals decided that, since there was no violation of the constitution or other legal provisions, the only course for it to follow was to uphold the decision of the Federal Power Commission.

Private utility interests believed there was additional cause for abiding by the decision of the experts. If Congress took upon itself the task of deciding between alternate power plans, it would be recommitting itself to a task for which it had neither the time nor the technical resources, a method of individual project review found wanting and abandoned years ago.

The most ardent foes of the high Hell's Canyon dam were the farmers of southern Idaho who viewed it as a threat to the more than two million acres under irrigation, and who were suspicious of any federal assurance to the contrary. The Idaho farmers reasoned that if the distant federal government operated a high dam, power needs would take precedence over water requirements. They feared that water would be let out of upstream irrigation reservoirs when needed to keep Hell's Canyon filled, and that they would be deprived of it as a consequence. Finally, the farmers of south Dakota believed that the water supply in the Snake River was inadequate for the high dam, and that the extra power it would furnish was hardly worth the expense.

Spokesmen for the Hell's Canyon dam denied that their project threatened the water supply of south Idaho. They kept assuring the farmers that the operation of

(Continued on page 309)

Noting that "overseas the question has not usually been public versus private power . . . but the need for more, rather than less, power," this economist evaluates the potentialities in developing hydroelectric power and atomic power.

Key to Economic Development

By Everett D. Hawkins

Professor of Economics and Sociology, Mount Holyoke College

One of the most popular films shown by the Office of War Information to millions of people overseas at the close of World War II was "TVA," the story of how power contributes to the economic and social development of a region. As a result, thousands of foreigners each year visit the TVA to see for themselves what power has done for the Tennessee Valley, and what power might do for their own river valleys. The film, not shown in the United States, emphasized public power. The United States in its various foreign aid programs has assisted public power development abroad since in most of the countries the only agency in the power business is the government. Overseas the question has not usually been public versus private power, as here in the United States, but the need for more, rather than less, power.

In deciding whether a country is economically developed or underdeveloped many tests have been used. Perhaps the best one relies on per capita national income. Underdeveloped countries are those with average incomes of $200 or less a year, while developed countries are those with $500 or more a year. A large number of countries belong to an intermediate category between $200 and $500 per person. Although income is perhaps the most reliable single guide, a number of other tests have been applied: rate of illiteracy, the average life expectancy, the percentage of people engaged in agriculture, and perhaps of even greater significance, the amount of energy consumed or the number of kilowatt hours of electricity used per year.

Chairman of the Department of Economics and Sociology, Mount Holyoke, **Everett D. Hawkins** *edited the pamphlet on* Indonesian Revolution: Second Phase *and authored two chapters for a Yale Handbook on Indonesia, 1956. Director of Information of the O.W.I. in Chungking; Hankow and Mukden, China, during World War II, he was Program Planning Officer of the E.C.A.-M.S.A. in Djakarta, Indonesia, 1951-1952, and Chief of the Indonesia branch of the T.C.A.-F.O.A. in Washington, 1952-1953. Currently he is participating in a senior seminar at Mount Holyoke on Atomic Energy: Its Uses and Social Implications.*

Lack of Power

In Asia and Africa the number of megawatt hours of commercial and non-commercial sources of energy consumed a year per person was a little over three; in South and Central America, between six and seven; in Europe, excluding Russia and Eastern Europe, 18; and in North America, over 60.[1] In both Asia and Africa the non-commercial sources of energy such as fuel wood, wood for charcoal-making, lumber mill waste, *begas,* and other vegetable fuels, exceeded the amount from commercial sources, while in North America over 70 per cent of the total energy came from commercial sources. If only electric power is considered, the differences are even more striking. In Pakistan the average electricity consumed in 1949 was only 1.9 kilowatt hours per person and in India about 13 kilowatt hours; while in the United Kingdom it averaged over 1000 and in the United States almost 2300 kilowatt

[1] United Nations, *Peaceful Uses of Atomic Energy,* Vol. I, pp. 18-20.

hours.[2] An American housewife in a kitchen may have more electricity at her command to mix a cake or toast a slice of bread than is available to a person in an underdeveloped country for all uses.

Economic Progress

Economic progress can be measured as man has moved from using his bare hands or crude stone tools to the development of animal power, water power, and energy from various fossil fuels. Professor Edward S. Mason of Harvard showed a relatively close correlation between the amount of energy consumption and national income per capita in 1952. Low energy consumption, equivalent to less than one metric ton of coal, was found in countries with incomes of less than $200 per year; while high per capita energy consumption and high incomes were reported in some parts of Europe and North America.[3]

World Production of Energy

World production of energy from commercial sources increased about 20 fold from 1860 to 1952. It is estimated that by the year 2000, energy requirements will be from four to seven times greater than they were in 1952. Until recently the largest gains in energy produced had been in the European and North American areas. Buchanan and Ellis, however, stress the highly developed electrical grid in Japan, which reaches every hamlet and farm. They believe: "This achievement goes far to explain the efficiency of the small-scale industry of that country" and further they point out how "possession of a large sector of small-scale enterprise might give initial impulse to industrialization as well as to sustain its viability."[4] Like transportation and education, electric power plays a strategic role in the growth of modern, industrialized economies. For this reason, in spite of the heavy capital costs, countries wishing to develop have tended to give high priority to power projects.[5]

Although conventional steam plants and diesel units are being built in the underdeveloped countries, the example of the TVA and hydroelectric power is something which has fascinated the leaders in many of the less developed regions of the world. Ghana has its Volta River project; Egypt its Aswan Dam; Afghanistan opened its Sarobi hydroelectric power station with a capacity of 22,000 kilowatts in 1957. Indonesia wishes to dam the Asahan River near Lake Toba; India keeps its power projects as the hard core of its Second Five-Year Plan. Cambodia, Laos, Thailand and Vietnam look to the possible development of the Mekong River. Attention is given to the Jordan River Development in spite of political tensions.

River Valley Projects

Like the TVA, these river projects are multi-purpose programs. Navigation, flood control and irrigation may be as important as the generation of electricity. Furthermore, a great deal of the work on these projects, particularly on some of the irrigation aspects, can be done by the people in the area with relatively little heavy equipment. In fact, some of these programs can be used as schemes to provide employment for a substantial number of people. The building of the power plants may provide jobs for a small number of skilled workers.

In most cases, however, the underdeveloped countries have to import from abroad their electrical equipment, their heavy construction machinery and many of their engineers. The heavy capital costs of these projects is perhaps the factor most seriously limiting their growth. The introduction of large quantities of electrical energy, however, changes the economic and social conditions of the people as it did in the Tennessee Valley. The dams, therefore, are only the first link in the chain of economic development.

The March, 1958, issue of the *United Nations Review* carried as its lead article: "Harnessing the Mighty Mekong" (pp. 6-9). The United Nations Economic Commission for Asia and the Far East (ECAFE) has for

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[2] Meier and Baldwin, *Economic Development*, New York, John Wiley and Sons, 1957, p. 25.

[3] *Peaceful Uses of Atomic Energy*, Vol. I, p. 53.

[4] Buchanan and Ellis, *Approaches to Economic Development*, New York, Twentieth Century Fund, 1955, pp. 271, 278-9.

[5] Compare the views of Charles Kindleberger, *Economic Development*, New York, McGraw Hill Book Co., 1958, pp. 286-7, 313-344.

some years been interested in studying river valley development. A technical study was made in 1956 of the Mekong River which runs 2,625 miles from the snowy mountains of Tibet to the South China Sea through Cambodia, Laos, Thailand and South Vietnam. Late in 1957, a U.N. team of technical experts from France, Japan, Canada, India and the United States surveyed the river in some detail under the leadership of Lt. General Raymond A. Wheeler who had headed the Suez clearance project. In January, 1958, General Wheeler in his final report stated:

> The Mekong is one of the major rivers of the world . . . with great potentialities for service to Southeast Asia in the fields of navigation, the development of hydro-electric power and related water uses. The control of its floods and improvement of drainage can be accomplished with reasonable works and in most instances in connection with its development for the useful purposes of navigation, irrigation and power. Wise conservation and utilization of its waters will contribute more toward improving human welfare in the area than any other single undertaking. (p. 9.)

Major Dams Needed

The construction of several major dams would yield an estimated 4 million kilowatts of firm energy per year. Navigation would also be opened to landlocked Laos. Electric power and navigation would make it possible to exploit rich forest areas and the deposits of iron ore, tin, lime, bauxite, lead and zinc in those four countries. Furthermore, the use of water storage barrages would provide some 23 million acres of irrigated land which could be used to help rice cultivation and to develop a much needed diversification of crops including maize, cotton, tobacco, soya beans and peanuts.

At the annual meeting of the ECAFE held in March, 1958, at Kuala Lumpur, Malaya, the United States government pledged financial support to the development of the Mekong River and offered $2 million immediately in order to carry out further detailed engineering and development surveys. As the *United Nations Review* article concluded: "The development of the Mekong could very well change the whole face of Southeast Asia." (p. 9.)

Political Problems

The immensity of all river valley developments makes progress necessarily rather slow. Not only engineering and economic problems delay the development but also political issues, such as the lack of cooperation among the nations in a given river valley. Although cooperation seems good in the Mekong Valley, the same cannot be said about the proposed Jordan River project. The United States government had shown great interest in the Jordan Valley plan, sending some of its key leaders to the area, such as Gordon Clapp, when he was chairman of TVA, and Eric Johnson. Great political differences must be solved before the project can be implemented. The United Nations may be in a better position to resolve some of these difficulties than the United States. With all the new alignments in the Arab world, the prospects for economic development in this valley in the near future do not seem bright.

Although Arab-Israeli conflicts have delayed the Jordan River development, the Aswan Dam in Egypt became involved in the cold war struggle between the United States and the Soviet Union. The United States government and the International Bank for Reconstruction and Development had studied the proposals of Egypt to undertake a major project in the Upper Nile Valley. When United States Secretary of State John Foster Dulles in the summer of 1956, not liking the political developments in Egypt, announced that the United States would no longer be ready to furnish money for the project, Nasser retaliated within a few weeks by taking over the Suez Canal. Soon thereafter, British and French troops landed in an abortive attempt to reopen the Canal. Although there was some talk that Russia might finance part of the project, the Aswan Dam was put in cold storage, a victim of the cold war.

Even if the political problems are solved, the underdeveloped countries of the world do not have the necessary domestic capital to finance these large river valley develop-

ments. They require large sums of foreign capital. The United States government has made certain loans and grants for power development purposes. The main foreign lending agency of the United States government, the Export-Import Bank of Washington, authorized 182 credits to 36 countries, totalling just over one billion dollars during the fiscal year ending June 30, 1957. Of these loans $45 million were authorized for electrical generating equipment.[6]

U. S. Loans

The Bank has lent money to the Helmand Valley Project in Afghanistan; it has provided generating equipment and engineering services to the Republic of China; and it has helped the electrification program of Indonesia. It has financed electrical power generating equipment for Iran; it has made several loans for turbo generating units to various power companies in Japan; and it has provided funds to the National Power Corporation of the Republic of the Philippines for the development of hydro-electric power. In addition to these loans in Asia, the Bank has helped develop many power projects in Latin America countries. The United States government has also made various types of grants through the International Cooperation Administration, and its predecessor organizations, to provide earth moving equipment, turbines, generators, engineering service and technical training.[7]

The United Nations also has made grants under its Expanded Technical Assistance Program and loans from the International Bank for Reconstruction and Development (I.B.R.D.) for power purposes. For the four years, 1953-1956, the Technical Assistance Program spent $635,000 on projects in the field of power production and distribution. Although the International Bank for Reconstruction and Development is an international institution, most of its loanable capital comes from the United States and, therefore, the United States is concerned with the Bank's loans.

Loans totalling $869 million were granted for electric power generation and distribution out of a total of just over $3 billion made by the I.B.R.D. from 1947 to June 30, 1957. No other category of loans was so large. These power loans were placed all over the world: $178 million in Africa, $145 million in Asia, $29 million in Australia, $186 million in Europe and $331 million in the Western Hemisphere. The countries which received loans for power purposes include: Austria, Belgium, Brazil, Ceylon, Chile, Colombia, Ecuador, El Salvador, Finland, France, Iceland, India, Italy, Japan, Lebanon, Mexico, Nicaragua, Norway, Pakistan, South Africa, the United Kingdom as guarantor for Southern Rhodesia and Rhodesia and Nyasaland, Uruguay and Yugoslavia. To date the Bank loans in the power field have added 7.5 million kilowatts of generating capacity "representing more capacity than was available in the whole of Latin America at the time the Bank's development lending began."

In 1957, the Bank reported:

> With the completion of the Maithon Dam in India, the Damodar Valley multi-purpose project for which two bank loans have been made took an important step forward during the year. This project, apart from providing power for Calcutta, will provide both power and water-transport services in a region which contains three-quarters of India's coal reserves, the two largest iron and steel plants, a fertilizer plant, cement works and other major industrial enterprises. It will also increase the supply of irrigation water and reduce the risk of flooding which in 1943 caused damage to agricultural land estimated at over $15 million. The Maithon Dam is mainly a flood-control structure, but it will also add 60,000 kilowatts to power capacity in the valley. This hydro-electric capacity, which is expected to come into operation by the end of the year, will complement the 150,000 kilowatts of thermal capacity installed four years ago at Bokaro with Bank assistance. Of the seven reservoirs projected for the Damodar Valley, four are now completed.[8]

The Bank also made a loan to the Tata group for a new thermal plant at Tramby

[6] Ex-Im Bank of Washington, *Report to Congress for the Twelve Months Ending June 30, 1957*, Part I, p. 4.
[7] For details see International Cooperation Administration, *Operations Report, Data as of June 30, 1957*, especially pp. 37, 68.
[8] International Bank for Reconstruction and Development, *Twelfth Annual Report, 1956-57*, Washington, p. 7. For capacity figures, see p. 17.

which will add 125,000 kilowatts for the city and state of Bombay.

In the first Five Year Plan in India the largest component in the $5 billion public sector was $1.3 billion for irrigation and power. In the second Plan the amount was increased to $1.9 billion out of a little over $10 billion in the public sector. In 1939, India had just over a million kilowatts of generating capacity. In 1955 this had risen to 2,659,000 of installed capacity, of which 1.5 million kilowatts were generated by steam, just under a million by hydro plants and 200,000 by diesel engines. Private companies still owned about 44 per cent of the total installed capacity. With a number of public power projects included in the first and second Five Year Plans, the percentage of public power will continue to increase.

The second Five Year Plan called for 42 power generating schemes, including both new plans and extensions to existing power stations. These included 23 hydro-electric and 19 steam generating plants. Among the largest projects were the Bhakra Nangal, the Koyna, the Rahand and the Durgapur thermal station. In addition to the Tata power system, private plants were to be greatly extended in Bengal and Bombay. It was the hope of the second Five Year Plan to double the per capita consumption of electricity.[9] Even with all the financial reasons to reduce the magnitude of the second Plan, power was one of the core projects that the Indian Government wished to continue. To help finance this basic core of the second Five Year Plan, the United States early in 1958 negotiated with the Indian government a loan of $150 million from the Ex-Im Bank and a second loan of $75 million from the Economic Development Fund.

Atomic Power Plants

New developments in atomic power plants have made some people talk in terms of unlimited energy. To underdeveloped countries who need so much energy to catch up in their development with the Western world, this might sound like a panacea. Thus far, however, atomic energy as a source of electricity is far from free. In fact, electricity from the Shippingport reactor in Pennsylvania is several times more costly than power from modern steam plants burning either coal or oil in the same region. (See the study by Leslie W. Dunbar, "The Controversy over Nuclear Power," in this issue, pages 275-282.) Costs of constructing the first atomic plants have tended to run much higher than estimated; in fact, one concern has refused to make any more fixed-price contracts.

These reports of growing construction costs made many experts skeptical about the immediate prospects of generating commercial power by atomic fusion. In several cases, however, a great deal more energy is being developed in the atomic plants than was originally estimated by the engineers. This is such an encouraging factor that more firms have become interested in developing power from atomic energy. After further experimentation both here and abroad, however, when it will be possible to build plants with standardized equipment, costs will decline substantially. Exactly when the generation of power from atomic fusion will be lower in cost than the generation of power through conventional equipment is hard to predict, but it is certain that the equivalent point will probably come much earlier in New England and other areas where conventional fuels are of relatively high cost.

Advantages of Atomic Energy

Atomic energy as a source of electrical energy has particular attraction for some of the underdeveloped countries that are genuinely short of coal, oil, natural gas and potential water power. A country may have some of these resources so far from the centers of population, or their exploitation may be so difficult, that conventional power plants are not economically feasible. Of course, some countries without coal or oil might import these raw materials, but this adds transportation costs which may be greater than the original costs of the raw materials. Furthermore, if a country has to import raw materials to generate power, this

[9] Government of India, *Ministry of Information and Broadcasting, A Reference Manual, 1957*, pp. 287, 541-3.

must be done continuously, thus creating a regular drain on the foreign exchange reserves. Atomic plants require relatively small quantities of fuel so that the transportation costs are negligible. Furthermore, fuels are not rapidly consumed. In fact the original fuel might be considered as a part of the capital construction of the plant.

Atomic plants can be built near or at the approximate site of the use of the power. This means it is not necessary to build long transmission lines as is sometimes required in hydro projects. The one serious problem of location is the danger of a possible accident or "runaway." For this reason it might be desirable at first, although adequate shielding and other safety devices have been developed, to locate nuclear plants outside of large, populous areas.

High Cost of Nuclear Plants

Although there may be some advantages to atomic energy in the underdeveloped areas of the world, the capital required to build a nuclear plant is greater than that needed for a conventional installation. In addition to the generating equipment which is essentially the same in both types of plants, the nuclear furnace, which needs to be very carefully and heavily shielded, is now much more expensive than the conventional boiler. Furthermore, the handling of radioactive fuels and wastes is a serious and costly problem.[10] It is hoped, however, that some of these costs may be offset by the generation of radioactive substances for which there will be commercial uses. Furthermore, certain types of reactors are breeders: the amount of nuclear fuel produced is greater than the amount of nuclear fuel introduced into the reactor. Because of the great shortage of capital in the underdeveloped countries of the world, nuclear power may not develop so rapidly there as in the more developed countries unless nuclear fuels and foreign loans are provided.

The United States has agreed to supply nuclear fuels to friendly nations with whom it has signed special agreements. By the end of June, 1957, the United States had signed research agreements with 32 countries and seven more were awaiting approval. Several underdeveloped areas in Asia, Africa and Latin America were included in the list. Power agreements had also been negotiated with seven of these countries, all of which were European or Commonwealth countries. Additional power agreements with 12 others were pending, including several Latin American countries, Formosa, and the Philippines. The United States government also agreed to set up an Asian Regional Nuclear Center in Manila. After a team from the Brookhaven National Laboratories visited a number of the Asian countries in 1956, the United States formally offered $20 million for capital expenditures and the initial operating costs of the Center. Both Japan and India have atomic piles which are now critical.

The United Nations International Atomic Energy Agency was established in 1957 to provide nuclear fuels and technical assistance in the use of radio-isotopes and the development of power from nuclear fission. Training programs for nuclear scientists, engineers and technicians will be needed if the underdeveloped countries are to develop nuclear power plants.

Atomic Energy Loans

In 1957, the Export-Import Bank and the Atomic Energy Commission announced a plan to assist financially the construction of atomic power plants, including reactors for research and training purposes. Under this plan, the Bank was prepared to consider loans to privately or publicly owned companies to finance the purchase of United States equipment, materials and services for atomic power plants abroad on terms similar to those provided in its financing of conventional types of power plants. The first atomic energy loan was made by the Bank to Spain to purchase a research reactor and related equipment at a cost of $385,000. The Bank is aware that a number of American firms are discussing substantial contracts for atomic power plants abroad.[11]

Just as the world is beginning to realize

[10] Netschert, B. C. and Schurr, S. H., *Atomic Energy Applications with reference to Underdeveloped Countries*, Baltimore, Johns Hopkins University Press, 1957, pp. 45-50.

[11] Ex-Im Bank, *op. cit.*, pp. 22-23.

some of the many complications in developing nuclear power, especially in the underdeveloped countries, a new vision of cheap and abundant power is on the horizon. The spectacular experiments in various countries with controlled fusion reactions offer the exciting possibility that power may come directly from water without the accompanying problem of radioactive wastes, and the use of conventional generating equipment. Thus far the experiments have succeeded in a controlled reaction for only a minute fraction of a second, but what may have seemed impossible a short while ago, now lies within the realm of possibility.

Conclusion

The underdeveloped countries at present lack adequate power facilities. Great interest has been shown in hydro generation of electricity as part of multi-purpose development projects in a number of the major river valleys of the world. In spite of the large capital costs of such plans, many substantial projects have been financed by the United States and the I.B.R.D. With a real shortage of the necessary raw materials and natural facilities for power generation, some underdeveloped nations are looking longingly at the vision of power from nuclear reactors.

Certainly, power from fission is not unlimited, but requires more capital and much more technology than conventional methods. Some assistance is being offered to the underdeveloped countries by the new United Nations International Atomic Energy Agency, the U. S. Atomic Energy Commission and the Ex-Im Bank. Whatever the financial or technological problems, power projects are being undertaken by many underdeveloped countries as a key step in the process of economic and social development.

"The Communist imperialists are seeking to amalgamate the current of new nationalism into their own movement. This makes the total challenge more acute. Asia and Africa and other non-industrialized countries are becoming major battlefields of the cold war.

"Until a few years ago Communist imperialism sought to expand by a policy of threats, bluster or armed action. These crude and obvious methods ceased, however, to pay dividends.

"Now the Soviet leaders follow a new technique. Where they formerly treated all free nations as enemies, they now profess the greatest friendship toward them—particularly toward those which seek economic development.

"Having set out on this new course, they have followed it with energy—and capital and skilled manpower. They have made offers of economic help to nations in all parts of the globe. They and other bloc nations have already entered into agreements with 16 non-bloc nations for lines of credit or grants totalling nearly $1.6 billion in economic assistance and an additional $400 million for military assistance.

"The Soviets are providing not only promises, but performance. They are actually providing capital assistance according to their pledges. They are providing rapidly increasing numbers of technicians. They are engaged in vigorous efforts to increase their trade with nations in all parts of the free world.

"The Communist bloc's economic offensive is, of course, not designed genuinely to help newly developing countries to achieve sound economic growth within a framework of political independence. Just as the people now within the Sino-Soviet bloc are exploited, so the newly independent peoples would be exploited. But that goal is camouflaged behind propaganda which represents that only through association with the Communist bloc can the less developed peoples achieve the progress that they seek."

—John Foster Dulles, in a statement given before the House Foreign Affairs Committee, February 26, 1958.

Some comments on books recently . . .

Received At Our Desk

On Conservation and Public Power

CONSERVATION. An American Story of Conflict and Accomplishment. By David Cushman Coyle. (New Brunswick: Rutgers University Press, 1957. 271 pages, photographs and index, $5.00.)

THE NEW ST. LAWRENCE FRONTIER. The Seaway and the Future. By Sidney C. Sufrin and Edward E. Palmer. (Syracuse: Syracuse University Press, 1957. 98 pages, including tables, $3.00.)

MULTIPLE PURPOSE RIVER DEVELOPMENT. By John V. Krutilla and Otto Eckstein. (Baltimore: Johns Hopkins Press, 1958. 320 pages and index, $4.50.)

Despite the importance of the topic, little has been written recently on conservation or river basin development. In his new study of *Conservation,* David Coyle traces the 50-year history of the conservation movement in the United States. He includes chapters on American forestry, soil and wildlife conservation, rural electrification, the problems of fuels, minerals and metals, and the world-wide picture. River basin development, he feels, is practical, economical and constitutional in the United States. After discussing the accomplishments of the TVA, the problems faced at Hell's Canyon and in the New England area, the Dixon-Yates conflict and others, Mr. Coyle points out that "Further examples [of river basin planning] are obstructed at present largely by the opposition of the electric companies to the public power features of river development. . . .

"Difficult as the organization of the TVA is to reproduce, the TVA success has inspired many river basin projects abroad, from India to Brazil to the Highlands of Scotland. These examples of conservation in its most comprehensive form may be expected to multiply. . . ."

A major public power project involving a foreign power is the St. Lawrence Seaway. In *The New St. Lawrence Frontier,* authors Sidney C. Sufrin and Edward E. Palmer discuss the significance of the Seaway for Americans and Canadians. They provide a statistical analysis of the economy of the St. Lawrence area and predict future benefits of the Seaway not only for the people of northeastern United States and southern Canada, but for all the people of both countries. After an appraisal of the region's communities the authors concluded that ". . . the St. Lawrence River is relatively unimportant to the area." Consequently, they predict that the St. Lawrence Seaway will provide a dynamic new element "in what has been and is now a relatively stable economic structure."

Hoping to "clarify some of the complex problems involved in river basin development," the authors of *Multiple Purpose River Development* have tried to sketch in "a meaningful framework for economic analysis of river system development." Efficiency has been chosen as a meaningful goal in evaluating various development plans, although the authors are quick to point out that in our society "efficiency is not the only, and perhaps not the dominant value. . . ." Measuring the efficiency of various multiple purpose river development projects, "a large measure of objective analysis is possible, even in those areas of the water development field where controversy has eroded the common ground for fruitful discussion."

Selected case studies are offered, including detailed analyses of the Hell's Canyon project, the Alabama-Coosa River System, and the Willamette River Case. The authors conclude that "while public participation in the water field is required if efficiency is to be achieved, the degree and

forms of participation pose another question. There is a strong sentiment in favor of the idea that some combination of public and private efforts can overcome the limitations of purely private development, while utilizing private institutions to the extent that they can be effective. Our effort has been to lay the basis for a better understanding of the range of possibilities for achieving efficient cooperative arrangements in the water resources field." If better understanding grows out of clear, abundant and objective background information, then the authors will go far toward a realization of their stated objective. Tables, charts and maps add to this scholarly study.

Nuclear Energy, the Fallout and the Future

OUR NUCLEAR FUTURE. Facts, Dangers and Opportunities. By Edward Teller and Albert L. Latter. (New York: Criterion Books, 1958. 173 pages and glossary, $3.50.)

ON NUCLEAR ENERGY. Its Potential for Peacetime Uses. By Donald J. Hughes. (Cambridge: Harvard University Press, 1957. 248 pages, glossary and index, $4.75.)

RADIATION. What It Is and How It Affects You. By Jack Schubert and Ralph E. Lapp. (New York: Viking Press, 1957. 269 pages, glossary, bibliography and index, $3.95.)

THE VOYAGE OF THE LUCKY DRAGON. By Ralph E. Lapp. (New York: Harper and Brothers, 1958. 198 pages, with illustrations, $3.50.)

The scientific controversy over the dangers of radioactive fallout and radiation in general is highly colored by the political, military or pacifist views of the contestants. So technical and so statistical are the divergent claims that the layman can read these studies and indeed, many more, without any reasoned conclusion.

All five scientists whose books are noted here are well known. Edward Teller is the "father of the hydrogen bomb"; Albert Latter is a theoretical physicist now with the Rand Corporation in California. As these two evaluate the "facts, dangers and opportunities" in *Our Nuclear Future,* the dangers to our generation and to the human race from nuclear testing, real as they may be, are outweighed by the advantages—military and otherwise—of continuing to test and use nuclear explosives.

Ralph Lapp, also a well-qualified nuclear physicist, and his medical colleague, Jack Schubert, believe that on the contrary the type of nuclear bombs heretofore tested constitutes a far greater *Radiation* danger to human beings and to future generations.

In a more popularly written book, *The Voyage of the Lucky Dragon,* Ralph Lapp describes the effects of radioactive fallout on the 23 Japanese fishermen who were accidentally exposed to this hazard during nuclear bomb tests in March, 1954. One of the fishermen later died and as Ralph Lapp reads the record evidence points a fairly steady finger at radioactive poisoning.

In his study of *Our Nuclear Future* Edward Teller footnotes the information that the fisherman died, "presumably from complications associated with the exposure to radiation," with the further qualification that "There seems to be a good possibility that he died from a hepatitis entirely unrelated to the initial radiation exposure."

The Voyage of the Lucky Dragon offers much evidence to refute this, and brings into focus the undeniable danger of continuing nuclear tests.

Perhaps the most detached of the four studies, *On Nuclear Energy,* has been made by Donald J. Hughes, on the staff of Brookhaven National Laboratory, whose major interest here is the atom's "potential for peacetime use." Dr. Hughes notes that "an increase in the rate of weapons testing by a factor of 150 would bring the average radiation rate for all people on the earth to the figure that is necessary to double the natural mutation rate," and continues, "This doubling of the natural mutation rate can be considered a very serious matter." As he evaluates the current situation, however, he notes that it is fortunate that "it now seems extremely unlikely that the rate of radioactive fallout will increase markedly because of the effect

of international study groups and the development of 'cleaner' bombs."

In a recent open letter (to *Life* magazine), Dr. Teller claims that

> The actual difference of opinion concerning the facts of radiation hazards is not great. To our minds the important issue is whether the small and uncertain hazards of fallout will induce us to abandon one of our most important methods of defense in the face of real danger of Communist aggression.

Careful reading of these studies affirms Dr. Teller's thesis that there is little serious basic disagreement in statistical fact. Disagreement stems from the interpretation of the known figures, partly because of the various and obvious bias of the writers, partly because the far-reaching effects of continuing and perhaps increasing radioactivity on the human body and the human race are still a matter of conjecture. It is obvious that given meager statistical evidence about the danger from fallout, and the equally pressing danger of nuclear war, the doctor, the strategist and the pacifist will arrive at widely divergent conclusions.

The layman is confused and confounded in this controversy by his ignorance of nuclear physics and questions of strategy and the secrecy that still surrounds nuclear weapons testing and research. The earnest reader may derive wry humor from the dedication of Donald Hughes' book: "To Mother. This one is for you—it contains only two equations." Many mothers, and fathers too, might begin the study of nuclear science with the Hughes book, but they should be warned that even with only two equations the reading is highly technical. All American citizens should nonetheless avail themselves of the growing opportunity to keep up with information on nuclear developments for war and peace and on expanding research into radiation hazards.

History and Biography . . .

AL SMITH AND HIS AMERICA. By Oscar Handlin. (Boston: Little, Brown & Company, 1958. 207 pages, notes and index, $3.50.)

The problem that Al Smith presented to American voters in 1928 has never been satisfactorily resolved, according to this author. Is it possible for a member of New York's East Side Irish immigrant society to aspire to be President of the United States? Or is he entitled only to second class citizenship?

From assemblyman to governor to presidential candidate, the personality of Al Smith is sharply drawn by Mr. Handlin against the background of ward politics in the Battery section of New York. Attention centers on Smith's political career and his contribution to American democracy. His able administration of New York State during his governorship is cited as an exemplary model of efficient state government.

Al Smith's awareness of the injustices of an industrial society made him the spokesman for the immigrant laborer. He had tremendous popular appeal for the people of the city with whose problems he could sympathize. An adroit politician, he was able to define the political issues of the day in terms simple and understandable.

Mr. Handlin's account of the status and problems of the Irish immigrant group of New York's East Side is skillful. The personalities of the day, Smith's political friends and enemies, are brought into focus. The industry of the first 30 years of this century is vividly described. The author has captured the tempo of the times, the hurrying pace of life and thought in early twentieth century America keeping step with the growth of the country. He focuses the rhythm and tension of the 1920's in the recurrent theme: "everybody's doing it, doing it."

Smith quickly fell into failure, both political and economic, following the election of 1932. The thesis of this book is that "his failure, after 1928, had in large measure also been a national failure." His achievements lay in "awakening the conscience of the nation to the needs of the urban working people" and in "the model of a life of service begun on the East Side, a demonstration that the urban, the immigrant society that had nurtured him was not alien, but a precious part of

American life." This is another in the Library of American Biography, edited by Oscar Handlin.

THE PURITAN DILEMMA. The Story of John Winthrop. By Edmund S. Morgan. Edited by Oscar Handlin. (Boston: Little, Brown & Company, 1958. 224 pages, acknowledgments and sources, and index, $3.50.)

John Winthrop, the first governor of the Massachusetts Bay Colony, was a man born to lead. In addition, he was a Puritan dedicated to "establishing a kingdom of God on earth." The Puritan's dilemma—at what point was a righteous man justified in withdrawing from a corrupt church or state—was slowly resolved. Convinced that he must "live in and with the world," Winthrop refused to permit himself or the colony the luxury of separatism which in practice meant association only with those of "superior purity." Winthrop was a wise governor, holding the colony together by administering the law with discretion whenever necessary.

The story of the Puritans in the early Massachusetts Bay Colony is interestingly interwoven with the life of Governor Winthrop, who was responsible for the peace, spiritual welfare and heresies of the colonists. The author has an excellent grasp of the problems faced by this group, and presents them in absorbing and readable fashion. The book is enlivened by Mr. Morgan's ability to handle his material with clarity and simplicity. This book is also an addition to the Library of American Biography.

THE ASHANTI: A PROUD PEOPLE. By Robert A. Lystad. (New Brunswick: Rutgers University Press, 1958. Illustrated. 212 pages and index, $5.00.)

Ashanti is the central territory of the new state of Ghana. The term Ashanti refers not only to the area but to the people who reside there. The author, who is an anthropologist, spent a year in Ghana. He has chosen to describe the culture of the people in the little town of Goaso in the southwestern corner of Ashanti. The daily life, religion, economy, education and government as experienced by the Ashanti are described.

STRATEGY AND COMPROMISE. By Samuel Eliot Morison. (Boston: Little Brown, 1958. 120 pages, $3.00.)

Samuel Eliot Morison is justly famous for his biographies, historical studies and the multiple-volume *History of United States Naval Operations in World War II.* In *Strategy and Compromise* he tells of the strategic decisions made from 1940 to 1945 by the Chiefs of Staff of the United States and Great Britain. He describes the inevitable disagreements, compromises and solutions that went into grand strategy in Europe and the Pacific. It appears from this account that the fighting was not confined to the trenches. In general, it would seem that Mr. Morison probably endeared himself to the British as much as General Douglas MacArthur or Admiral Ernest King, neither of whom wanted the British Fleet in the Central Pacific. Admiral Morison (U.S.N., Retired) offers vigorous opinions and writings to match his characters; to offer the contents of this small book in the form of lectures at Oxford, as he did, must have led to the same "spirited and flashing discussions" he described in Combined Staff Meetings.

KEY TO VICTORY. The Triumph of British Sea Power in World War II. By Lt. Commander P. K. Kemp. (Boston: Little Brown, 1958. 382 pages, index, photographs and maps, $6.00.)

The head of the Admiralty's Historical Section, Archivist of the Admiralty's Library, has written the history of British naval activity from 1939 to 1945. As much as is possible in a single volume, Lt. Commander Kemp has covered the story of the war at sea. The book is interesting reading as a companion to Morison's *History of Naval Operations in World War II.* It is typically British in that it offers few personal opinions and seems almost to underplay the drama of events. In general, Lt. Commander Kemp gives us a calm, well-ordered account of a section of naval warfare not nearly so well known to Americans as the Pacific operations of the United States Navy.

Current Documents

THE ARAB FEDERATION

Joint Communique on the Iraq-Jordan Union

On February 14, 1958, Iraq and Jordan issued a joint communique establishing the union of the two states into the Arab Federation. The official translation of this agreement is reprinted in full below:

In response to an invitation from His Majesty King Hussein Ibn Talal, King of the Hashemite Kingdom of Jordan, His Majesty King Faisal II of Iraq came to Amman on Tuesday 11th February 1958 and H.R.H. the Crown Prince of Iraq also arrived on 13th February 1958. Several meetings were held under the Presidency of their two Majesties and in the presence of H.R.H. the Crown Prince of Iraq. The meetings were attended on the Iraqi side by their Excellencies Senator Towfiq Al-Suweidi, the Foreign Minister Burhan-ul-Din Bashayan, the Finance Minister Nadim Al Pachachi, the Minister of Justice Abdul Rasul Al-Khalisi, the Chief of the Royal Diwan Abdullah Al-Bakr, the Ambassador of Iraq in Amman Baha-Uddin Nuri and the Chief of Staff of the Iraqi Army General Rafiq Arif; and on the Jordanian side by their Excellencies the Prime Minister Ibrahim Hashim, the Deputy Prime Minister and Foreign Minister Samir Al-Rafa'i, the Minister of the Royal Palace Suleiman Tuqan, the Minister of National Economy Khulusi Al-Khairi, the Minister of Education and Information Ahmed Al-Tarwana and the Chief of the Royal Diwan Bahjat Al-Talhuni, the Minister of Defense and Agriculture Akif Al-Fayez, the Ambassador of Jordan in Iraq Farhan Shubeilat, the Chief of the Jordanian Army Staff General Habis Al-Majali and the Assistant Chief of Staff General Sadiq Al-Shery.

The result of the discussions at these meetings was that the two parties reached an agreement to form an Arab Federation between the two States on the 14th February 1958. The following is the text of the Agreement:

WHEREAS the great Arab Revolt, led by His late Majesty AL-HUSSEIN IBN ALI, heralding the birth of a new dawn for the Arab Nation, and reflected by sacrifice for the liberation of the Greater Arab Motherland and the unification of its peoples and its lands with the aim of regaining the station of the Arabs among the nations of the world and contributing to the advancement of civilization; and

WHEREAS that blessed Revolt derived its inspiration from the will of the Arabs to achieve freedom and unity on the basis of their glorious history and their faith in themselves and the immortal message of their Nationalism, and

WHEREAS the message of the Arab Revolt—whose author gave his life in its cause—descended to sons and grandsons, inherited by generation after generation as the torch that guides the Nation of the Arabs in its march towards the achievement of its cherished aims of comprehensive unity and full freedom and sovereignty and for the recovery of its glory, the preservation of its sacred inheritance and the realization of its aspirations for an auspicious future under this blessed unity.

NOW therefore, the two Hashemite States have resolved to form a Federation between them based on these high aims, and in fulfillment of this object and their National aims agreement has been reached on what follows:

(1) An Arab Federation is formed between the Kingdom of Iraq and the Hashemite Kingdom of Jordan to be known as the Arab Federation and to take effect as from Friday, 24 Rajab 1377 A.H. corresponding to 14th February 1958 A.D. This Federation shall be open to the other Arab States who may wish to adhere to it.

(2) Each of the two States shall preserve its independent, international identity and its sovereignty over its territories and retain its present regime of government.

(3) International treaties, pacts and agreements entered into by either of the two States before the formation of the Federation shall continue to be observed by the State that concluded them but shall not bind the other State. As for international treaties, pacts and agreements that may be concluded after the establishment of the Federation and which shall come within the terms of the Federation, these shall come under the competence and authority of the Federal Government.

(4) As from the date of the official proclamation of the establishment of the Federation, measures for the complete unification of the following matters shall be executed by the two States of the Federation:

(a) The unification of Foreign Policy and Diplomatic representation.
(b) The unification of the Armies of Jordan and Iraq (the Arab Army).
(c) The removal of Customs barriers between the two States and unification of their Customs laws.
(d) The unification of educational programmes.

(5) The two parties agree to take the necessary steps as quickly as possible to unify currency and co-ordinate economic and financial policies between the two States.

(6) When necessity or the interests of the Federation require the unification of any matter not mentioned in Article 4, the necessary steps shall be taken in accordance with the Constitution of the Federation to bring such matters within the competence and authority of the Federal Government.

(7) The flag of the Arab Revolt shall be the flag of the Federation and of the two States.

(8) (a) Federal matters shall be dealt with by the Federal Government consisting of a Legislative Chamber and Executive Authority.

(b) The members of the Legislative Chamber shall be elected by the Parliaments of Iraq and Jordan respectively, from among their own members, the two States to be equally represented in numbers.

(c) The members of the Executive Authority shall be appointed in accordance with the provisions of the Federal Constitution to assume responsibility for the matters which come within the competence of the Federal Government.

(9) The King of Iraq shall be the Head of the Federal Government and in the event of his absence for any reason, the King of Jordan shall be Head. Each of the two Kings shall retain his Constitutional powers in his own Kingdom. In the event of any other State adhering to the Federation, the question of Head of the Federation shall be reconsidered as circumstances may require.

(10) The seat of the Federal Government shall alternate between Baghdad and Amman and for a period of six months in each.

(11) (a) The Federal Government shall draw up a Constitution for the Federation in accordance with the bases set out in this Agreement and the Constitution of each of the two States shall be modified to the extent and limits required by the provisions of the Federal Constitution.

(b) The necessary steps and measures shall be taken to establish the Federal Government and draw up the Federal Constitution within a period not exceeding three months within the date of the signature of this Agreement.

This Agreement shall be ratified according to the Constitutional procedures observed in the two States. Done at Basman Palace, Amman, this Friday 24 Rajab 1377 A.H. corresponding to 14th February 1958 A.D.

According to the 1957 census, the population of Iraq has increased by 36 per cent in the last ten years. The population of Iraq is 6,538,109, of which 3,278,060 are men and 3,260,049 are women.

(Continued from page 295)

Hell's Canyon would be subordinate to all existing and future rights for irrigation and other requirements. The proposal of the Idaho Power Company as originally sponsored was open to similar criticism, and it was only after the plan for the federal project was modified that the private utility interests adjusted theirs. What is more, the weight of the expert testimony held that there was enough water for 50 years of justifiable irrigation and economical operation of Hell's Canyon. The high dam, contrary to the arguments of critics, would make possible a greater expansion of irrigated farming in south Idaho than the three little dams of the Idaho Power Company.

The power question figured prominently in at least two Oregon elections as a part of the broader resources issue. Republican leaders sought to minimize the importance of public power, while the Democrats played it up for all it was worth. In 1954 Senator-elect Richard L. Neuberger, the first Democrat in 40 years to be sent to the United States Senate from Oregon, and the winner by about 2,000 votes, observed that: "The whole national forest, recreation and grazing situations cut very deeply. People felt that Secretary of the Interior McKay and Senator (Guy) Cordon were threatening the whole outdoor recreation program . . . ." Neuberger also asserted he "sensed real bitterness against McKay on the grounds that he was trying to wreck a good power program and hurt farm co-ops and the Rural Electrification Administration."

Public power became a campaign issue in 1956 when Wayne Morse, an indefatigable Hell's Canyon supporter, a former Republican turned Democrat, and a sharp critic of the Eisenhower Administration, came up for re-election. But in this instance power again was only one of the issues; farm price supports and the ability of Eisenhower to carry the full burden of his office for another four years were others. McKay, Eisenhower's first Secretary of the Interior and the man who had to reverse the New Deal-Fair Deal resources policy of 20 years' standing, was considered the only Oregonian capable of defeating the maverick Morse, and rebuilding the political fortunes of the state Republican party. That year the Democrats conducted another vigorous campaign, and for the second time since 1950 their registration exceeded the Republicans.

Eisenhower's easy victory in Oregon was more of a personal tribute than a vindication of his policies; while the triumphs of Morse and a number of state Democrats were viewed more as a party achievement. Factors, other than power, that figured in the election included conservation, the heavy influx of new residents into the state, the absence of able liberal Republican leaders, and the campaign of political education by the Oregon State Federation of Labor.

Hell's Canyon and the Future

At this stage it appears that the federal power program of New Deal-Fair Deal days has been temporarily sidetracked by an unsympathetic administration. But the high Hell's Canyon dam is far from a dead issue; its numerous friends refuse to let it expire. In fact, they have received fresh encouragement from a recent Federal Power Commission decision denying a private utility the right to build two small dams in the Middle Snake, and the stress the commission placed on the Engineers' Report of 1948 in reaching this decision.

Public power advocates believe that other factors will aid their cause. Growing unemployment in the Pacific Northwest, as well as across the nation, has built up pressure for a reviewed public works program; and the Eisenhower Administration has been influenced by this clamor. Supporters of public power likewise believe that a high dam in an area suffering from joblessness is one of the best prescriptions for unemployment. Another flood threat could also focus attention on the storage potential of the Hell's Canyon site.

Currently, another Hell's Canyon bill is before Congress. The steps that President Eisenhower and Congress will take are unknown, yet friends of the measure expect that the trend of events will favor them and the high dam. If nothing else, the American public can rest assured that the advocates of federal and private power will again wage relentless campaigns.

A CURRENT HISTORY Chronology covering the most important events of March, 1958, to provide a day-by-day summary of world affairs.

The Month in Review

INTERNATIONAL

Disarmament

March 10—It is revealed at the U.N. that the Soviet Union has told the U.S. it will not attend a meeting of the Security Council on disarmament if the Council is to discuss anything but procedural matters, or if foreign ministers (instead of permanent representatives) attend the meeting.

March 26—U.N. Secretary General Dag Hammarskjold says that heads of government discussions on disarmament are no substitute for U.N. negotiations.

March 28—The Soviet Foreign Ministry protests that U.S. plans for nuclear weapons tests in the Marshall Islands beginning in May, 1958, violate U.N. trusteeship.

March 31—The Soviet Union announces that it is not going to test any more nuclear bombs; it calls on the U.S. and Great Britain to follow its example. If they do not, the Russians will resume testing.

Seato

March 4—Pote Sarasin, Secretary General of the Southeast Asia Treaty Organization, says that the alliance is a barrier to Communist imperialism in the area. His view is expressed in Seato's annual report, published today.

March 13—In a communiqué issued at the close of Seato's fourth annual meeting of the Council of Ministers, foreign ministers reaffirm their faith in unified, collective defense against the possibility of Communist aggression. At the same time, they promise to work toward disarmament.

United Nations

March 3—Major General Carl Carlsson von Horn is appointed chief of staff of the U.N. Truce Supervision Organization in Palestine.

March 30—A United Nations report reveals that international agencies and Western nations distributed $5.5 billion in economic aid to underdeveloped nations in the two-year period, 1954-1956. Of this amount, the U.S. contributed directly $2.8 billion.

West Europe

March 19—Robert Schuman is elected president of the six-nation European Economic Assembly by acclamation at its opening meeting.

March 21—At its first meeting, the European Economic Assembly votes to split the chamber seats among three main party groups—Christian Democrats, Socialists and Liberals. The Assembly is the deliberative body of the coal-steel, common market and atomic energy pools.

THE ARAB FEDERATION

March 7—Foreign Minister Samir el-Rifai leaves for Baghdad to discuss a constitution for the new Arab Federation.

March 19—Jordan and Iraq agree on a constitution for the Arab Federation. King Faisal of Iraq is head of state.

ARGENTINA

March 17—For the first time since the strike began, January 27, almost all 40,000 bank employees show up at their jobs. The workers receive a $12 a month raise.

March 21—Two Cabinet ministers resign because of differences concerning foreign investment to develop Argentine oil resources. Such investment is now forbidden by law.

THE BRITISH COMMONWEALTH

Canada

March 18—Lester B. Pearson, Liberal party leader, asks Canada to support an agreement for the immediate banning of nuclear weapons testing.

March 31—Prime Minister John Diefenbaker and the Conservative party gain the greatest election victory in Canada's history, winning 202 seats out of 265 in the Federal House of Commons.

Ceylon

March 3—Communist China offers Ceylon a loan of 50 million rupees (about $10.5 million) at 2.5 per cent for flood relief.

March 4—Ceylon accepts the Chinese loan offer.

March 18—Prime Minister S.W.R.D. Bandaranaike says he has invited African-Asian powers to confer at Colombo on inter-regional trade and coordinated planning.

Ghana

March 18—It is revealed in Accra that independent African states will be represented at a conference in Accra, Ghana, on April 15.

India

March 4—The Export Import Bank and the Development Fund announce terms of 2 U.S. loans to India totaling $225 million in credits.

March 13—Prime Minister Jawaharlal Nehru appoints Morarji Desai as Minister of Finance, succeeding T. T. Krishnamachari.

March 14—Vice-President Sarvepalli Radhakrishnan leaves New Delhi for a three week visit to the U.S.

United Kingdom

Great Britain

March 3—The House of Commons rejects a Labor party motion censuring the Government's actions in lifting or relaxing rent controls.

March 6—The Labor party and the Trades Union Congress ask that British-based planes carrying hydrogen bombs be forbidden to make patrol flights.

March 7—Defense Minister Duncan Sandys says he will visit Moscow.

Britain says it is not true that she has attacked the territory of Yemen from the Aden Protectorate.

March 8—The Admiralty reveals that a Royal Navy task force is assembled at Bermuda for the largest joint Canadian-British naval exercise since World War II.

March 18—Prime Minister Macmillan tells Commons that the U.S. Air Force and the Royal Air Force will continue to use hydrogen bombs in operational and training programs based in Britain.

March 21—Prime Minister Harold Macmillan rejects suggestions that Britain embark on nuclear disarmament.

March 22—Sir Winston Churchill suffers a relapse after his recuperation from pleurisy and pneumonia but is making steady progress again.

North Ireland

March 21—Election returns show a victory for the Pro-British Unionist party, which wins 34 of the 52 seats in the House of Commons of North Ireland. The anti-British Nationalist party wins 7 seats; the Northern Ireland Labor party wins 4.

West Indian Federation

March 26—In elections to the 45-member House of Representatives, the Socialist-oriented Labor party led by Norman W. Manley wins a majority of seats. The Labor party holds 24 seats; the opposition Democratic Labor party holds 19; one seat is in doubt; one is held by an independent.

CAMBODIA

March 23—Voters elect a new National Assembly.

March 24—The Popular Socialist party led

by Prince Norodin Shanouk wins all 61 seats in the Parliament, according to announced returns.

CHINA (Nationalist)

March 14—U.S. Secretary of State Dulles stops in Taiwan to confer with President Chiang Kai-shek.

March 19—In the first major Cabinet shake-up in Premier O. K. Yui's government, formed in 1954, the Ministers of Interior, Finance and Economic Affairs are dismissed.

CHINA (The People's Republic)

March 1—Chou Hsing, one of 7 Vice-Ministers of Security, is relieved of his duties.

March 17—It is reported that 3 Cabinet ministers, dismissed from their posts last January, have also been ousted from the non-Communist Democratic Party Front's Standing Committee of the Chinese People's Political Consultative Conference.

COLOMBIA

March 16—Colombians vote for the first popularly elected Congress in almost a decade.

March 17—Incomplete returns indicate that Dr. Guillermo Leon Valencia, head of the moderate Conservatives, was defeated by the Right-wing branch of the Conservatives in yesterday's elections.

March 31—Liberal party chief Alberto Lleras Camargo is chosen joint Liberal-Conservative presidential candidate.

COSTA RICA

March 18—President-elect Mario Echandi reveals that his country has signed a 5-power pact with other Latin American governments to take joint action to repel Communist advances.

CUBA

March 1—It is reported that newspapers and radio stations carried the Roman Catholic dignitaries' plea for a "government of national union" despite the presidential Palace's request to hush up the declaration. The Cabinet ministers in the government of President Fulgencio Batista resign in anticipation of running for office in the national elections scheduled for June 1.

March 4—President Batista reaffirms his determination to hold the elections scheduled for June 1.

March 6—Batista announces his new Cabinet.

March 10—In celebration of the sixth anniversary of his seizure of power, President Batista defends his administration and promises that the forthcoming national elections will be handled fairly. The anticipated general strike is not called.

March 12—Constitutional guarantees are suspended and the Cabinet resigns as sabotage and terrorism continue unabated. A general revolutionary strike is also threatened.

March 17—Rebel leader Fidel Castro issues a manifesto calling for "total war" against the Batista regime. April 1 is set as the opening date for the conflict.

March 20—The Superior Electoral Tribunal decides to postpone the general elections scheduled for June 1 until November 3.

March 27—Thirty-six New Yorkers, all but one born in Cuba, are stopped in the Gulf of Mexico en route to join the rebel forces led by Fidel Castro.

FRANCE

March 1—France receives an acceptance from Soviet Foreign Minister Andrei A. Gromyko to attend a foreign ministers' meeting to plan the agenda for a heads-of-government meeting.

March 4—The French Cabinet irons out a split among its members by voting to give "absolute priority" to the 1958 budget for the Algerian war.

March 7—The National Assembly endorses Premier Felix Gaillard's North African policy by approving, 286-147, military credits of 1,300 billion francs for the continuation of the war in Algeria. However, Gaillard fails to receive an overwhelming vote of confidence. In addition to the 147

deputies opposing him, 160 abstained or were absent in the 593-man assembly.

March 13—Policemen demonstrate in Paris. They demand higher wages because of the extra risk involved in dealing with Algerian insurgents. The Cabinet yesterday voted them bonuses, but they are considered insufficient.

March 14—Prefect of Police in Paris André Lahillonne is dismissed as a result of yesterday's police strike. Minister of the Interior Maurice Bourges-Maunoury offers his resignation, but it is refused.

Chief of Staff of the Air Force General Paul Bailly resigns.

March 18—The National Assembly, by a vote of 282-196, upholds the issue of constitutional reforms to give stability to the executive branch of the Government.

March 22—The National Assembly approves a constitutional reform bill to strengthen the executive and thus lessen Cabinet crises by a vote of 308-206. The bill must next be approved by the Council of the Republic followed by a nationwide referendum.

March 28—Independents join a vote to defeat Right-wing attempts to curb Premier Gaillard's freedom of action in dealing with the North African situation. Right-wing deputies are defeated by a vote of 317-235.

FRENCH EMPIRE

Algeria

March 3—It is reported that 1700 Algerian refugees sought refuge last week in Tunisia. A "ratissage" (raking) by French soldiers in the region of Bekkaria caused the exodus.

March 4—The new 70-member Municipal Council, at Oran, giving some semblance of local autonomy, is sworn in. There are 35 Europeans and 35 Algerians on the Council.

It is reported that 8000 Algerian rebels and 500 French troops were killed in the first two months of 1958. In 1957, according to French commander Raoul Salan, 32,000 rebels were killed and 2500 French soldiers were lost.

March 5—The French Cabinet issues the first decree to put into effect the Algerian reform law recently passed.

March 11—From Rome, Algerian Nationalists issue a statement calling for talks with France for a cease-fire and for free elections to a "sovereign" Algerian constituent assembly.

French West Africa

March 27—Two of the three leading political parties in French West and French Equatorial Africa, the African Socialist Movement and the African Convention party, merge with 5 local parties into a single party dedicated to federal union with France.

GERMANY (EAST)

March 1—A conference of university professors in East Berlin is told to make students toe the party line.

GERMANY (WEST)

March 6—Visiting in Washington, Defense Minister Franz Josef Strauss outlines acceptable conditions for an atomic free zone in Central Europe, which call for the unification of Germany.

March 14—Head of the Federal Press Office Felix von Eckhardt announces that Germany will not insist on a discussion of the question of German reunification at a top level, heads-of-government conference.

March 15—The Federal Press Office hedges on its statement yesterday on the reunification issue. It declares that no top level conference can afford to exclude such an important topic from its agenda.

March 25—The Bundestag, after violent debate, approves the Government's atomic armament policy. The Bundestag rejects by resolution the Soviet offer of a peace treaty, of reunification by confederating East and West Germany, and of reunification negotiation with East Germany.

March 28—The Bundestag's Defense Committee approves the purchase of 24 Matador weapons and 6 launching ramps from the U.S.

GREECE

March 1—The government of Constantine Karamanlis reaches a crisis over the draft electoral law. Fifteen parliamentary supporters of the bill go over to the opposition.

March 3—King Paul names former Minister of Education Constantine Georgakopoulos to head a caretaker government following the resignation of Karamanlis. The new government must introduce a new electoral law.

March 13—The parliament gives a vote of confidence, 265-60, to the caretaker government.

GUATEMALA

March 2—General Miguel Ydigoras Fuentes is inaugurated for a six-year term of office.

HAITI

March 13—Chief of Staff Brigadier General Antonio Kebreau is dismissed from his post by President Francois Duvalier. Kebreau is replaced by Brigadier General Maurice Flambert.

HUNGARY

March 21—The U.S. accuses the Hungarian government of withholding information about the fate of several victims of the revolution of 1956.

INDONESIA

March 2—The Indonesian government puts up a tight blockade around the revolutionary government in Central Sumatra.

March 4—Indonesia's Parliament, 10 months after the agreement has been signed, approves a $15 million U.S. loan for road development and power generating plants.

March 10—Indonesian warships and planes attack Padang following a troop landing on Sumatra's east coast.

March 11—Captain Agus Soroto issues a statement that the army, navy and air force are in full operation to clean up the rebel forces in Central Sumatra.

March 12—Indonesian forces capture Pakanbaru in Central Sumatra. A paratroop invasion of the area is also reported.

March 16—Medan in North Sumatra, the last stronghold of the Jakarta government in this area, is lost when troops in North Sumatra desert to the rebel side. They capture Medan, a military center, after several hours of fighting.

March 17—The Indonesian Army declares that it has recaptured Medan.

March 23—Jakarta announces that it has regained all the major oil centers in Central Sumatra which are U.S.-owned.

March 26—The Indonesian army is reportedly pushing closer to the rebel capital at Bukittinggi.

IRAN

March 21—The Shah of Iran, who recently divorced Queen Soraya, because she could not give him an heir to the throne, tells his people that he has sacrificed love for the sake of his country.

IRAQ

(See also the *Arab Federation*.)

March 3—General Nuri as-Said becomes premier as a step toward strengthening the newly-created Arab Federation. He replaces Abdul Wahab Marjan.

March 26—Iraq's Parliament approves a constitutional amendment giving the vote to women with a primary education. It also approves an amendment empowering King Faisal to enter into union with another country.

ISRAEL

March 4—The U.S. Export-Import Bank gives Israel a $24 million credit for water, irrigation and other agricultural development.

March 21—Israel and Jordanian army units supervise their respective Bedouin tribes in the Negev border area to prevent fighting over the few grassy spots. The Bedouin tribes have lost 95 per cent of

their winter wheat crop because of drought.

March 25—Premier David Ben-Gurion says that peace between Israel and the Arabs is possible if other powers guarantee Israeli borders.

March 30—Shelling between Israelis and Syrians occurs for 2 hours over the Israeli drainage operations at Lake Hula. U.N. truce observers negotiate a cease-fire between the 2 opponents.

ITALY

March 17—President Giovanni Gronchi dissolves both the Senate and the Chamber. The Chamber's term expires in June but the Senate's term should run through 1959.

March 24—The election campaign officially opens. Eighty-six parties are entered in the election race.

JAPAN

March 19—Nationalist China ends commercial relations with Japan.

KOREA (NORTH)

March 6—A U.S. jet fighter plane on a training mission is shot down near the demilitarized zone between North and South Korea.

North Korea releases 26 persons abducted into North Korea aboard a South Korean plane.

March 17—The Communist North Koreans return the jet fighter pilot shot down March 6. The pilot of the plane is also released.

KOREA (SOUTH)

March 4—The U.S. and 15 other nations who fought in the Korean war tentatively agree to reject the Communist Chinese proposal to withdraw all troops from both South and North Korea.

LEBANON

March 12—Premier Sami es-Solh resigns. His resignation is accepted by President Camille Chamoun.

March 13—Sami es-Solh is formally requested to form a new, pro-Western government. He accepts the invitation.

March 14—Premier es-Solh forms a new 14-member Cabinet.

LIECHTENSTEIN

March 23—As a result of yesterday's elections, the Progressives gain one seat in the Parliament, giving them a total of 9. The remaining 6 seats in the 15-man body go to the Opposition Union party.

LUXEMBOURG

March 26—Premier and Foreign Minister Joseph Bech resigns from his post as premier.

MOROCCO

March 3—Morocco proposes a union of Tunisia, Algeria and Morocco to settle the North African controversy.

March 28—Four Mauritanian leaders pledge their loyalty to Morocco. France does not recognize Morocco's claim to suzerainty over Mauritania, a province in French West Africa.

NORWAY

March 31—The Norwegian passenger ship, *Skaubryn* catches fire and sinks in the Indian Ocean. All 1100 passengers are reported safe aboard a British ship.

PERU

March 8—A "march of silence" organized by the Christian Democratic party to protest a prohibition on political meetings in the center of Lima is broken up by police squads.

PHILIPPINES

March 19—President Carlos P. Garcia announces that he will ask the U.S. to loan the Philippines $300-$350 million to help offset pressing financial difficulties.

POLAND

March 2—The Central Committee gives formal support to First Secretary of the United Workers (Communist) party Wladyslaw Gomulka who has recently been opposed by Stalinist elements. His policy of maintaining as much independence as possible of the Kremlin is endorsed.

March 6—Stefan Matuszewski, a supposed Stalinist, is dismissed as chairman of the commission to supervise the party machinery.

PORTUGAL

March 19—The Portuguese Opposition party announces that Admiral Manuel Carlos de Quintao Meireles has received its nomination for president.

RYUKYU ISLANDS

March 19—Complete returns from the elections on March 16 for the Ryukyu legislative assembly reveal that the anti-Communist parties won 24 of the 29 seats. The Leftist Okinawa People's party gained 3 seats, for a total of 5.

SAUDI ARABIA

March 24—It is announced that King Saud is granting some of his powers to his brother, Crown Prince Faisal. Faisal gains control of financial, foreign and internal affairs.

March 29—The Defense Ministry, according to reports released to a Cairo newspaper, has been taken over by Prince Faisal, who has ousted Defense Minister Prince Fahd.

SPAIN

March 1—The Spanish government announces that it has successfully ended a 3-week drive to expel Moroccan rebels from the Spanish Sahara.

March 26—Strikes erupt throughout Spain. Three thousands workers in Barcelona walk out.

THE SUDAN

March 11—Final but unofficial figures show the pro-Western Umma (People's) party gaining in the nation's first general election, winning 68 seats in the 173-seat lower house. The pro-Egyptian National Unionists gain 47 seats; the People's Democratic party wins 26; other parties divide the other 32 seats. The Umma party led by Premier Abdullah Khalil has been in charge of the government since July, 1956.

March 14—Elections for the Senate are tallied; the Umma party wins 14 of the 30 contested seats; the National Unionists win five.

March 20—Abdullah Khalil continues as Premier as the newly elected House gives him a strong majority.

March 22—The newly formed Senate opens and chooses Dr. Amin el Sayed as Speaker.

March 26—Premier Abdullah Khalil announces formation of his new Cabinet; he retains the post of Defense Minister.

SYRIA

(See also *United Arab Republic.*)

March 5—Lieutenant Colonel Abdul Hamid Serraj accuses King Saud of Saudi Arabia of planning to assassinate Egyptian President Nasser to deter the union of Egypt and Syria.

TUNISIA

March 17—British and U.S. intermediaries fly to Paris with moderate Tunisian demands. The Tunisians demand that France recognize Tunisian sovereignty over the port and naval base of Bizerte, and other concessions.

March 18—The Right-wing members of the French Parliament oppose a proposal that France withdraw 22,000 troops from Tunisia and cede 4 military airfields to Tunisia.

March 20—President Bourguiba, in a speech before the Tunisian Constituent Assembly, announces that he will cooperate with France. He thanks the U.S. and Britain for their services.

March 21—The French government declares that Tunisian "non-belligerence" in the Algerian war is a prior condition to settling the Franco-Tunisian dispute.

March 30—The U.S.-British good offices team, mediating the Franco-Tunisian controversy, discusses the possibility of stationing U.N. observers along the Tunisian-Algerian frontier.

U.S.S.R.

March 1—The Soviet Union proposes a foreign ministers' meeting for April to map out an agenda for a subsequent heads of government conference. These proposals were presented yesterday to ambassadors from the Nato countries.

Soviet Ambassador to the U.S. Mikhail A. Menshikov suggests that the U.S. and the Soviet Union sign a treaty of friendship and cooperation.

March 7—The Soviet Union drops its insistence that a fixed date be set for a heads-of-government meeting, before the foreign ministers convene to set up an agenda.

March 8—The Soviet Union warns Asian members of Seato, prior to a treaty council meeting, against allowing missile and atomic weapons bases to be set up on their territories for possible use against the U.S.S.R.

March 15—The Soviet Union declares that it would accept a ban on the use of outer space for military purposes if the U.S. would give up its bases on foreign soil.

March 17—The people elect delegates to the Supreme Soviet.

March 19—Premier Nikolai Bulganin, in a note to Prime Minister of England Harold Macmillan, asserts that the West is delaying a summit conference while engaged in a military buildup.

March 25—The Kremlin rejects the U.S. proposal that foreign ministers meeting to prepare a heads-of-government parley discuss substantive issues as well as the time, place and agenda of such a conference.

March 27—The Supreme Soviet elects Nikita S. Khrushchev as Premier. Nikolai A. Bulganin resigns from this post.

March 31—The U.S., British and French embassies in Moscow ask the Soviet Foreign Ministry to meet with them to prepare a heads-of-government meeting.

Bulganin is appointed chairman of the board of the State Bank. The Supreme Soviet approves all Khrushchev's political appointments. Anastas I. Mikoyan and Frol R. Kozlov are both given the title of First Deputy Premier.

THE UNITED ARAB REPUBLIC

March 2—President Nasser and Crown Prince Saif al-Islam Mohammed al-Badr of Yemen announce that Yemen will federate with the United Arab Republic.

March 3—Syrian Lieutenant General Afif Bizri, Chief of Staff of the Syrian Army, resigns. This recent action is taken as evidence that Nasser has gained total control of the Syrian Army.

March 6—President Gamal Abdel Nasser announces appointments for the joint ministries for Syria and Egypt. Egyptians hold the key posts of defense and foreign affairs.

March 7—The United Arab Republic makes its first appearance at the U.N. when a delegate from the United Arab Republic is seated on the trusteeship council.

March 8—It is reported that Nasser has accused King Saud of Saudi Arabia of trying to assassinate him. Earlier this week, according to reports, Nasser withdrew the Egyptian military mission training Saudi troops.

UNITED STATES

Agriculture

March 5—The Agriculture Committee of the Senate approves proposals for the U.S. to sell, trade or give away almost $5 billion in farm surpluses in the next two years.

March 10—The Senate turns down a proposal to increase the 1958 cotton acreage.

March 13—Voting 50 to 43, the Senate approves a resolution to freeze farm price supports and acreage allotments at levels not to fall below those of 1957.

March 21—The Senate sends the farm price support "freeze" bill to the White House.

As finally amended the "freeze" is limited to one year.

March 24—The Senate passes and sends to the President a bill suspending penalties on wheat farmers who have overplanted their 1958 wheat acreage allotments.

March 25—Senate Republicans vote 17 to 14 to ask the President to sign the one year price support freeze bill.

March 31—President Eisenhower vetoes the one-year price support freeze bill.

The Economy

March 8—In a letter to Republican party leaders in Congress, the President lists seven steps he plans to counteract recession, including a proposal to use federal funds to "extend for a brief period" unemployment benefits for those workers whose benefits are or will soon be exhausted.

March 10—Vice-President Richard Nixon favors a tax cut instead of a huge Government spending program.

March 11—The Department of Labor and Commerce says that unemployment rose in February to 5,173,000, a post-war record.

March 17—The Federal Reserve Board reports that industrial production dropped three points in February; since August industrial production has declined 10.3 per cent.

March 19—The President releases $75 million in new federal funds and issues orders to accelerate local government and private and cooperative projects with federal aid.

The House of Representatives passes a $1.8 billion emergency housing bill and sends it to the White House.

March 21—The Bureau of Labor Statistics reports that consumer prices rose to a new record in February.

March 24—The A.F.L.-C.I.O. asks for an immediate tax cut of $6-$8 billion.

March 27—President Eisenhower lowers the ceiling on imports of crude oil. Procedures are set up to discourage violation.

President Eisenhower and Adlai Stevenson ask Congress to support a liberal foreign trade policy as they address separate sessions of a rally for the Reciprocal Trade program.

Foreign Policy

March 4—The United States agrees to let Jordan use $5 million in U.S. aid for a budget deficit.

March 5—The President tells Congress that the Eisenhower Doctrine is a cornerstone of U.S. policy in the Middle East.

The President reveals that Russian leaders have offered to come to the United States for a summit meeting.

March 6—The U.S. formally rejects Russian suggestions for a preliminary foreign ministers meeting to prepare for a summit conference.

March 7—The State Department reveals that it has accused the Soviet Union of violating international law by closing Peter the Great Bay.

Secretary of State Dulles leaves for Manila to strengthen Seato.

March 12—Foreign ministers representing the U.S., Britain and France meet in Manila to talk about Soviet proposals for summit talks.

March 15—The U.S. says that Russian suggestions for international control of outer space though a U.N. agency include "wholly unacceptable conditions."

March 24—Secretary Dulles defends American aid to India and Yugoslavia.

March 31—The U.S. says that free nations should not be deceived by the Soviet Union's statement that it is ending nuclear weapons testing, in a statement released by the State Department.

Government

March 1—The President is found to be fully recovered from his stroke after an examination at Walter Reed Army Medical Center.

March 3—The White House reveals details of an agreement between President Eisenhower and Vice-President Nixon in case of presidential disability. The President is to determine inability "if possible" and "so inform the Vice-President." If the

disability prevents the President from communicating with the Vice-President, the Vice-President determines the President's inability "after such consultation as seems to him appropriate under the circumstances." The President is to determine "when the inability has ended and at that time will resume the full exercise of the powers and duties of the office." In the meantime, the Vice-President will assume "the powers and duties of the office until the inability has ended." This agreement is intended to apply only to President Eisenhower and Vice-President Nixon personally.

Richard A. Mack resigns as a member of the Federal Communications Commission; his resignation is accepted by the President, who terms the action "wise."

March 4—Nine bipartisan senators propose a constitutional amendment authorizing the Vice-President to take over as acting President in case of Presidential disability.

March 6—President Eisenhower nominates Ambassadors to the Sudan, Costa Rica, Uruguay and Honduras.

March 10—President Eisenhower nominates John S. Cross of the State Department to the Federal Communications Commission, succeeding Richard A. Mack.

March 10—President Eisenhower reports to Congress that during 1956 the United States received about $36 million in collections and credits on World War II lend-lease accounts.

March 12—Voting 86 to 0, the Senate passes a $1.85 billion emergency housing bill as an anti-recession measure.

March 13—President Eisenhower names Maurice H. Stans to succeed Percival F. Brundage as Director of the Bureau of the Budget. Brundage resigns today.

March 27—Testifying before the Senate's Select Committee on Improper Activities in the Labor or Management Field, Walter P. Reuther, President of the United Auto Workers, says that his union was in error in its four-year strike against the Kohler company.

March 29—Walter Reuther charges that Republican critics are trying to destroy him and the U.A.W.

March 31—Michigan's Democratic Senator Pat Macnamara resigns from the Senate rackets hearing committee; he has said it is "rigged against labor."

Labor

March 5—Members of the International Ladies Garment Workers Union in New York and six neighboring states strike for higher wages.

March 11—105 thousand members of the I.L.G.W.U. return to work after they win demands for wage increases in their first strike in 25 years.

Military

March 4—Secretary of the Air Force James H. Douglas rejects a recommendation made by the Air Force Board for Correction of Military Records that the court martial proceedings against Brigadier General William (Billy) Mitchell should be nullified. In 1925, General Mitchell was courtmartialed and found guilty of violating Article 96 of the Articles of War in his attacks on superiors because they would not accept his views on the military importance of airpower.

March 5—A second Army Explorer satellite is fired but fails to orbit.

March 6—The second Explorer is believed to have burned up on re-entering earth's atmosphere after its failure to orbit.

March 8—The Navy's last active battleship, the Wisconsin, joins the "mothball fleet." The Navy is without a battleship at sea for the first time since 1895.

March 11—The Atomic Energy Commission admits that an underground atomic explosion in Nevada in the summer of 1957 was detected more than 2000 miles away. Originally, the A.E.C. claimed that it had not been detected further than 250 miles away.

A B-47 jet bomber drops an unarmed nuclear bomb accidentally near a farm in Florence, South Carolina. No atomic explosion occurs, but six persons are injured and a farm house is wrecked.

March 12—The Air Force orders an investigation of yesterday's accident to "insure the maximum safety" when Air Force planes carry bombs.

March 15—A congressional investigating

committee accepts the A.E.C. contention that there was no intent to deceive the public about the distance at which last summer's underground nuclear explosion was detected.

March 16—In an interview in Washington, A.E.C. Commissioner Willard F. Libby recommends that an international agreement set a limit on how much radioactive material each nuclear experimenting nation may place in the atmosphere and stratosphere. This would restrict nuclear weapons tests.

March 17—A 6.4 inch Navy satellite Vanguard is fired into orbit.

March 20—General John B. Mendaris receives command of four major missile research and development units of the Army.

March 26—An Army Jupiter-C rocket fires Explorer III into orbit; its life is expected to be brief because three rocket stages did not fire as planned.

President Eisenhower says that the U.S. will invite foreign scientists including Communist scientists to watch nuclear test explosions in the Pacific in the summer of 1958.

President Eisenhower says he may be willing to negotiate a "reliable" agreement for a nuclear test ban without a simultaneous ban on weapons production.

Eighteen leading scientists advise the Administration that the cost of a first round trip to the moon will be about $2 billion.

The Air Force has ordered all bomber crews to "lock in" their nuclear bombs on practice missions.

March 30—A.E.C. Commissioner Willard F. Libby says that the U.S., in terms of radioactivity, is "the hottest place in the world," and that "a major fraction of the fallout in the United States is of Russian origin."

March 31—The Army reveals plans to reorganize and modernize National Guard and Army Reserve units in the next 30 months.

Supreme Court

March 3—The Supreme Court refuses to grant a request made by six states that Chicago be forced to return water taken for domestic use into Lake Michigan. The water is now being discharged into the Illinois Waterway.

The Supreme Court dismisses a suit by 23 former Hollywood writers and actors who claim that their blacklisting from the movie industry was unconstitutional.

In a five to four ruling, the Supreme Court holds that when federal property is leased to or held by private persons it loses most of its constitutional immunity to taxation.

The Supreme Court lets stand a lower court order asking Prince Edward County, Virginia, to make a "prompt and reasonable start" toward school integration.

March 31—In divided decisions, the Supreme Court rules that the federal government may deprive native-born Americans of their citizenship, within constitutional limits.

The Court refuses to review the convictions of Matthew J. Connelly and T. Lamar Caudle for conspiracy to defraud the Government.

In a case involving Communist leaders, the Court rejects an attack on the rule that federal courts may punish for criminal contempt without a jury trial.

The Court votes 5 to 4 that a defendant who takes the witness stand voluntarily waives any right to plead the Fifth Amendment during cross examination in civil cases, as well as in criminal actions.

URUGUAY

March 1—The National Council elects Carlos Fischer to succeed outgoing President Arturo Lezama.

YUGOSLAVIA

March 23—Voters elect a new Federal Parliament and Assemblies in each of the 6 republics. All but six of the 301 seats in Parliament are uncontested.

March 24—President Tito's regime receives the voters' approval.

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